# Appendix A BLM Lands Available for Disposal

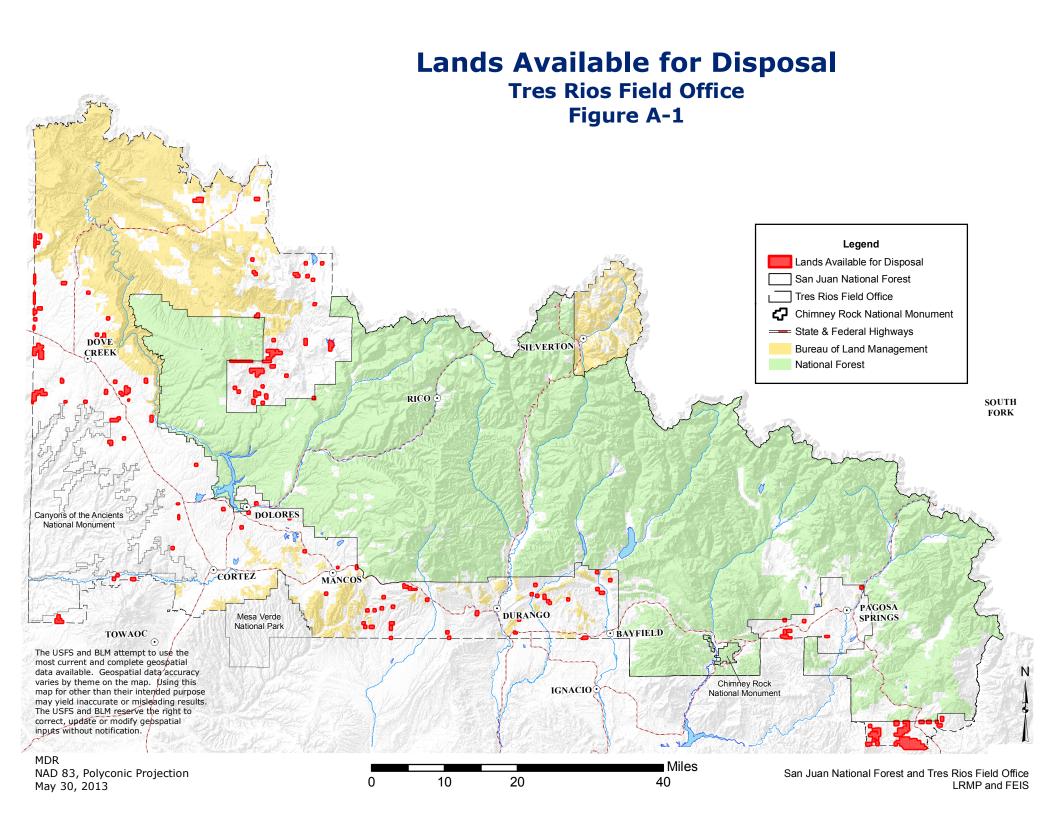
Table A.1: Tres Rios Field Office Lands Available for Disposal by Parcel

Table A.1. Tres Klos Fleid Office	c Danus Avanable	
Location	Acres	
(Township, Range, Section)	20	
T34N R10W S6	39	
T34N R10W S7	37	
T34N R7W S17	83	
T34N R9W S10	26	
T34N R9W S11	5	
T35N R10W S26	88	
T35N R7W S10	40	
T35N R7W S15	79	
T35N R7W S2	40	
T35N R8W S17	80	
T35N R8W S18	38	
T35N R8W S18	40	
T35N R8W S21	39	
T35N R8W S21	39	
T35N R8W S24	40	
T35N R8W S7	41	
T35N R9W S35	38	
T36N R7W S34	39	
T32N R1E S1	38	
T32N R1E S15	80	
T32N R1E S16	312	
T32N R1E S17	463	
T32N R1E S18	194	
T32N R1E S19	53	
T32N R1E S19	56	
T32N R1E S2	80	
T32N R1E S20	475	
T32N R1E S21	513	
T32N R1E S22	425	
T32N R1E S23	41	
T32N R1E S3	78	
T32N R1E S5	306	
T32N R1E S6	160	
T32N R1E S7	376	
T32N R1E S8	311	
T32N R1W S10	455	
T32N R1W S 15	40	
T32N R1W S15	41	
T32N R1W S15	150	
T32N R1W S21	117	
T32N R1W S22	40	
T32N R1W S4	40	
T32N R1W S9	117	
T32N R2E S6	80	
T33N R2E S31	81	
T34N R2W S4	27	
T34N R3W S1	40	
T34N R3W S12	74	
T34N R3W S12	78	
T34N R3W S13	133	
	-	

oosal by Parcel	
Location	Acres
(Township, Range, Section)	neres
T34N R3W S14	66
T35N R2 1/2W S24	42
T36N R1W S32	40
T34N R12W S11	34
T34N R12W S2	80
T34N R12W S4	40
T34N R12W S5	40
T34N R12W S5	40
T35N R11W S15	39
T35N R11W S5	71
T35N R11W S6	98
T35N R12W S15	41
T35N R12W S20	42
T35N R12W S21	42
T35N R12W S22	42
T35N R12W S23	42
T35N R12W S31	40
T35N R12W S35	81
T35N R13W S8	41
T35N R19W S31	80
T35N R19W S32	80
T35N R19W S32	160
T36N R13W S24	22
T36N R13W S25	23
T36N R13W S27	10
T36N R14W S11	41
T36N R17W S11	40
T36N R18W S33	41
T36N R18W S34	40
T36N R18W S36	81
T37N R14W S21	40
T37N R15W S11	40
T37N R15W S15	41
T37N R15W S28	40
T37N R16W S13	43
T37N R17W S12	8
T37N R17W S24	11
T38N R16W S17	40
T39N R17W S17	39
T39N R17W S8	80
T39N R18W S10	40
T39N R18W S16	160
T39N R18W S27	40
T39N R18W S32	
T39N R18W S33 T39N R19W S2	79 31
T39N R19W S2	20
T39N R20W S3	1
T40N R14W S25	41
T40N R14W S6	80
1 101 111 111 50	

Location	
(Township, Range, Section)	Acres
T40N R14W S9	40
T40N R15W S1	78
T40N R15W S10	159
T40N R15W S11	444
T40N R15W S20	41
T40N R15W S23	41
T40N R15W S25	81
T40N R15W S26	81
T40N R15W S27	122
T40N R15W S29	41
T40N R15W S3	35
T40N R15W S34	83
T40N R15W S35	40
T40N R15W S4	68
T40N R15W S5	61
T40N R15W S6	31
T40N R17W S18	80
T40N R18W S22	40
T40N R18W S25	125
T40N R18W S26	40
T40N R18W S26	165
T40N R18W S28	80
T40N R18W S35	40
T40N R18W S36	5
T40N R19W S21	70
T40N R20W S25	120
T40N R20W S26	80
T40N R20W S35	285
T40N R20W S36	120
T41N R13W S22	206
T41N R13W S27	83
T41N R14W S20	40
T41N R14W S24	127
T41N R14W S28	81
T41N R14W S29	286
T41N R14W S30	82
T41N R14W S31	85
T41N R14W S32	122

Location	Acres	
(Township, Range, Section)	Acres	
T41N R18W S16	80	
T41N R18W S17	40	
T41N R18W S20	40	
T41N R18W S4	40	
T41N R20W S11	16	
T41N R20W S2	40	
T41N R20W S25	281	
T41N R20W S26	177	
T41N R20W S35	98	
T41N R20W S36	320	
T42N R13W S30	38	
T42N R13W S6	39	
T42N R14W S1	40	
T42N R14W S2	82	
T42N R15W S35	39	
T42N R15W S36	78	
T42N R19W S13	39	
T42N R19W S9	80	
T42N R20W S11	23	
T42N R20W S2	16	
T42N R20W S23	31	
T42N R20W S26	14	
T42N R20W S35	63	
T42N R20W S36	80	
T43N R13W S29	40	
T43N R14W S25 40		
T43N R14W S34	39	
T43N R14W S35	39	
T43N R15W S23	39	
T43N R15W S35	41	
T43N R15W S35	41	
T43N R20W S11 67		
T43N R20W S12 80		
T43N R20W S14 40		
T43N R20W S14 51		
T44N R15W S11 87		
T44N R16W S10 161		
T44N R16W S9	161	



# Appendix B Paleontological Resources

# GEOLOGIC FORMATIONS CONTAINING PALEONTOLOGICAL RESOURCES IN THE PLANNING AREA

The Bureau of Land Management (BLM) manages paleontological resources, including mitigation and sensitivity rankings per BLM Handbook H-8270-1, General Procedural Guidance for Paleontological Resources Management, BLM WO Instruction Memorandum (IM) 2008-09 on the Potential Fossil Yield Classification (PFYC) system, BLM WO IM 2009-11 on Assessment and Mitigation, and the Paleontological Resources Protection Act of 2009.

Major Geologic Units	Probable Fossil Yield Classification (PFYC)	Known Fossil Resources	
Quaternary <sup>1</sup> Alluvium	_	Shrub ox	
San Jose Formation <sup>1, 2</sup>	_	Diverse early Eocene vertebrate fossils along the eastern margin of the San Juan Basin	
Nacimiento Formation <sup>1</sup>	_	Brachiopods; fish, crocodiles, turtles, various mammals, and temperate flora in central San Juan Basin, outside the planning area	
Animas Formation <sup>1, 2, 3</sup>	3	59 species of fossil plants, consisting of 3 ferns, 1 palm, 55 dicots; various vertebrates including Triceratops, Discoscaphites, and Sphenodiscus; abundant petrified wood; typical late-Paleocene mammalian fossils	
Kirtland Shale <sup>1, 3</sup>	5	Baculites; various vertebrates, invertebrates, and plants in the western San Juan Basin	
Fruitland Formation <sup>1, 3</sup>	5	Baculites, vertebrates including dinosaurs; various vertebrates, invertebrates, and plants in the western San Juan Basin	
Pictured Cliffs Sandstone <sup>1, 3</sup>	5	Ammonites, cephalopods, baculites, ophiomorpha burrows, palm fronds, leaf impressions, petrified and carbonized palm wood	
Navajo Sandstone <sup>3</sup>	3	Vertebrate and invertebrate tracks and traces	
Chinle <sup>2, 3</sup>	5	Vertebrates (fish) and plants	
Cutler <sup>2</sup>	_	Vertebrates	
Lewis Shale <sup>1</sup>	_	Ammonites, baculites, partial skeleton of a mosasaur, Exiteloceras	
Dolores Formation <sup>2, 3</sup>	3	Flowering plants	
Mancos Shale <sup>2, 3</sup>	2–3	Invertebrates (ammonites, oysters, brachiopods, clams, crayfish burrows), sharks, large marine reptiles, fish, dinosaurs, pollen, plants	
Mesaverde Group, undivided <sup>1, 2, 3</sup>	3	Theropod dinosaur tracks, baculites, scaphites, plants, dinosaurs, mammals, crocodilians, turtles, snails, oysters	
Burro Canyon <sup>1, 3</sup>	3	Plants and invertebrates	
Dakota Sandstone <sup>1, 3</sup>	5	Plants, dinosaur bones and tracks	
Morrison Formation Brushy Basin Member Salt Wash Member <sup>1, 2, 3</sup>	5	Dinosaurs, lizards, other reptiles, birds, mammals, amphibians, fish, invertebrates, plants	
Cliff House Sandstone <sup>1, 3</sup>	5	Ammonites, crustaceans, clams, oysters, snails, starfish, sea urchins, shark teeth, amphibians, turtles, mosasaur, plesiosaur	

Major Geologic Units	Probable Fossil Yield Classification (PFYC)	Known Fossil Resources
Menefee Formation <sup>1, 3</sup>	5	Leaf impressions, palm fronds, conifers, reptile bones, fossil tree trunk
Point Lookout Sandstone <sup>1, 3</sup>	5	Worms, crustaceans, clams, ammonites, various animal tracks, driftwood

<sup>&</sup>lt;sup>1</sup> Adapted from: Carroll et al. 1999; Kues and Lucas 1987.

# **Description of Major Fossil-bearing Geology Formations in the Planning Area**

# Dakota Sandstone (Upper Cretaceous)

The Dakota Sandstone consists of dominantly yellowish brown to gray, quartzitic sandstone and conglomerate with subordinate thin, lenticular beds of gray claystone, impure coal, carbonaceous papery shale, and gray, friable, carbonaceous sandstone. Depositional environments are marine near the top and fluvial near the base. The Dakota Sandstone and its fossils characterize the beach and nearshore sands associated with the initial stage of the encroaching Cretaceous epicontinental seaway.

Dinosaur tracks, Tempskya wood, wood impressions, coals, and invertebrate traces are the types of fossils known to be present in the Dakota Sandstone.

# **Burro Canyon Formation (Lower Cretaceous)**

The Burro Canyon Formation is composed of light gray and light brown, fluvial, quartzose sandstone and conglomerate in thick beds with lenticular, greenish gray, locally purplish, siltstone, shale, and mudstone. The Burro Canyon Formation is a continuation of the basin fill atop the Morrison Formation, but with sediments derived from Sevier highlands in central Utah (Aubrey 1992).

Dinosaur bones and tracks, limonitic wood, seed pod, and leaf impressions are known in areas of the Four Corners region.

# Morrison Formation (Upper Jurassic)

Dominantly fluvial, subordinately lacustrine, sandstone and mudstone alluvial deposits make up the Morrison Formation. The Morrison Formation is a vast shallow-basin deposit that extends across nine western states. In the Four Corners region, the Morrison records the deposition of detritus derived from Jurassic Mogollan highlands of central Arizona. The coarser-grained lower members of the Morrison preserve remains of large river deposits with associated floodplain and shallow ponds and lakes. The Morrison Formation of the western United States is famous for its dinosaur fossils. Gymnosperm fossils are also known to occur. All of the four members of the Morrison Formation are fossiliferous. The Brushy Basin member has been studied by Brigham Young University at a location on Horse Range Mesa site, which contains dinosaur fossils.

<sup>&</sup>lt;sup>2</sup> BLM Colorado Oil and Gas Leasing Draft Environmental Impact Statement. April, 1990.

<sup>&</sup>lt;sup>3</sup> Final Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States, Appendix D: Potential Fossil Yield Classifications for Geologic Formations Intersecting Proposed Corridors Under the Proposed Action by State

The Brushy Basin member consists of variegated bentonitic lacustrine mudstone with a few lenses of chert-pebble conglomeratic sandstone, some of which contain uranium-vanadium deposits. Significant fossils include carnivorous dinosaurs like Allosaurus, sauropod dinosaurs including Camarasaurus, gastroliths (stomach stones), and petrified wood including Hermanophyton and Xenoxylon.

The Brushy Basin member and remaining members of the Morrison Formation generally contain dinosaur bones, petrified wood, and plant fossils in the Four Corners region.

# Junction Creek Sandstone (Upper Jurassic)

Pink or reddish orange, fine- to coarse-grained, poorly sorted eolian cross-bedded sandstones make up the Junction Creek Sandstone. The Junction Creek Sandstone, and the fossils it bears, records the sand dune deposits derived from winds off of the retreating Curtis Sea.

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# Appendix C Roadless Area Inventory and Wilderness Evaluation

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# **CHAPTER 1 – INTRODUCTION**

The purpose of this appendix is to describe roadless areas and the criteria used in evaluating the capability, availability, and need of each area on the San Juan National Forest (SJNF) as potential wilderness areas. It includes a summary of each area's physical and biological attributes, resource uses, recreation opportunities, special features, and management considerations.

In June 2012, the Colorado Roadless Rule was finalized and it affects U.S. Forest Service (USFS) management of all Colorado Roadless Areas (CRAs) managed by the agency. This rule affords protective measures and restrictions on resource uses and development intended to protect the roadless character and values found within these areas. See the *Rulemaking for Colorado Roadless Areas Final Environmental Impact Statement* for detailed description of the rulemaking process, the nine roadless area characteristics, and prohibited/allowed activities and exceptions within CRAs.

The Colorado Roadless Rule and the CRAs identified therein supersede all previous roadless area inventories within Colorado. As part of the Colorado Roadless Rule, inventoried roadless areas (IRAs) or portions of IRAs that were not included as CRAs are no longer required to be managed to protect their roadless characteristics. However, SJNF IRA units and acreages as described in the Land and Resource Management Plan (LRMP) and Final Environmental Impact Statement (FEIS) remain in this appendix for comparative purposes, and because they form the rationale for the Agency's wilderness recommendations. Table C.1 shows the CRAs as defined in the Colorado Roadless Rule.

Table C 1.	San Inar	National	Forest	Colorado	Roadless Are	0.0
Table C.1:	San Juan	Nationai	rorest	Colorado	Roadiess Are	as

CRA ID#	Unit Name	Acreage
309	Baldy	20,343
304	Blackhawk Mountains	17,533
302	East Animas	16,854
310	Fish Creek	13,533
294	Florida River	5,720
291	Graham Park	17,808
295	HD Mountains	25,044
306	Hermosa	148,103
235	Lizard Head Adjacent	5,805
292	Piedra Area Adjacent	40,841
293	Runlett Park	5,615
315	Ryman	8,665
240	San Miguel	64,263
284	South San Juan Adjacent	34,899
305	Storm Peak	57,617
285	Treasure Mountain	22,500
286	Turkey Creek 25,300	
320	Weminuche Adjacent 23,614	
303	West Needles 6,881	
287	Winter Hills/Serviceberry Mountain	5,115

The Colorado Roadless Rule is incorporated by reference in the LRMP, and it will be used to manage the 20 CRA units. The fact that the Colorado Roadless Rule has been approved since the scoping and draft phases of the LRMP, there are some inconsistencies in acreages and total number of units between the IRAs discussed in the Draft LRMP, and the CRAs discussed in the Final LRMP. The Colorado Roadless Rule is incorporated by reference in the LRMP/FEIS and this appendix. Of utmost importance is the fact that all CRAs will be managed under the Colorado Roadless Rule, while portions of IRAs not included in the CRAs will be managed under the LRMP direction. The Colorado Roadless Rule and its CRA inventory replaces all previous roadless area inventories in Colorado with regards to land management purposes.

Where the LRMP has more restrictive management requirements than the Colorado Roadless Rule, the LRMP requirements will supersede those of the Colorado Roadless Rule. It is important to note that Congressional designation of any national forest area as wilderness would supersede both the recommendations found within the LRMP and the 2012 Colorado Roadless Rule.

# CHAPTER 2 – BACKGROUND

# Previous Roadless Inventories and Wilderness Designations

Initial authority for roadless inventories and evaluations is based on the Wilderness Act of 1964 (Public Law [PL] 88-577). In response to Section 3 of the Wilderness Act, the USFS began a review of National Forest System (NFS) roadless areas larger than 5,000 acres in 1972 called the Roadless Area Review and Evaluation (RARE I) to determine their suitability for inclusion in the National Wilderness Preservation System. RARE II, the second and final review process begun in 1977, resulted in a nationwide inventory of roadless areas.

As a result of RARE II, in 1979, the USFS made wilderness, wilderness study area (WSA), and non-wilderness recommendations on 24 roadless areas in the SJNF totaling 743,000 acres. The Colorado Wilderness Act of 1980 (PL 96-560) designated 76,843 acres as wilderness and 93,100 additional acres as WSAs. The remaining acres (78% of the acreage) were released to multiple-use activities (USFS 1992:III-45).

The 1983 LRMP, amended in 1992, provided the management direction for the multiple-use strategy for managing the released roadless areas. The primary emphases were dispersed non-motorized recreation, management for wildlife indicator species, range management, and management for wood fiber production. A little less than half the roadless acres released was suited for timber production according to the LRMP.

Table C.2 summarizes the wilderness areas and the Piedra special management area previously designated by Congress in the SJNF.

Table C.2: Wilderness Areas and Piedra Area

Area	Current Acreage	Designation
Lizard Head wilderness	41,496	Colorado Wilderness Act of 1980
South San Juan wilderness	158,790	Colorado Wilderness Act of 1980
Weminuche wilderness	492,418	Wilderness Act of 1975, Colorado Wilderness Act of 1980, Colorado Wilderness Act of 1993
Piedra Area	63,250	Colorado Wilderness Act of 1993

# Roadless Inventory

The LRMP revision process required a new and more accurate inventory to address ongoing roadless area management issues. The inventory criteria for roadless areas and the process used to evaluate these areas' wilderness capability, availability, and need are explained below (as established by Forest Service Handbook [FSH] 1909.12).

Each undeveloped area on the SJNF was identified during the inventory and marked for further roadless study if it met one or more of the following criteria:

- Contains 5.000 acres or more: or
- Contains less than 5,000 acres but:
  - Is manageable in its natural condition;
  - Is a self-contained ecosystem such as an island;
  - Is adjacent to an existing wilderness; or

- Does not contain improved roads maintained for travel by standard passenger-type vehicles (i.e., facilities for purposes of travel by vehicles greater than 50 inches in width).

Areas were excluded from the inventory if they contained:

- Classified roads:
- Timber activities from 1960 to present;
- Developed recreation sites (e.g., ski areas, campgrounds);
- Active oil and gas wells/facilities;
- Utility corridors;
- Other infrastructure (e.g., buildings, tanks, towers, water diversions such as dams or bridges, pipelines); or
- Grazing features (e.g., corrals, reservoirs with headgates).

After all the roaded areas were excluded, roadless area boundaries were delineated as shown in Figure C.1. As a result of the recent inventory, 19 roadless areas were identified totaling 558,282 acres. Various management activities (e.g., creation of new wilderness, timber sales and associated roads, oil and gas activities, and other developments) have changed the unroaded character of approximately 213,600 acres of the 743,000 acres of roadless areas identified in the RARE II process.

# Potential Wilderness Analysis

FSH 1909.12 specifies that roadless areas be evaluated on the basis of the area's capability, availability, and the need for wilderness designation. Specific criteria used in the evaluation are described below.

#### Capability

FSH 1909.12-7.21 defines the capability of a potential wilderness as "the degree to which that area contains the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness." The following criteria were used to determine wilderness capability of each roadless area.

#### Environment

- 1) The degree to which the area provides visitors with the opportunity to gain a wide range of experiential benefits (e.g., solitude and serenity, spirit of adventure and awareness, sense of self-reliance); 2) the degree to which an area is natural and free from disturbance, and 3) the range of geological, biological, ecological strata, and other scientific, educational, historical values.
  - Opportunity for solitude low, moderate, high? Changing? Due to what? (considers human encounters, influence of outside development);
  - Does the area provide a feeling of isolation or a sense that civilization has been left behind?
  - Are there intrusions by "cherry stem" roads or private land inholdings?
  - Can the traveler see or hear evidence of civilization from within the area?
  - Is the area a guiet place free from motorized noise?
  - Challenge (degree to which area offers visitors opportunity to experience adventure, excitement, challenge, initiative, or self-reliance, unusual or typical);
  - Outdoor recreation opportunities (capability of providing primitive and unconfined types of recreation – e.g., camping, hunting, fishing, mountain-climbing, ski touring, canoeing, boating, river-rafting, backpacking, hiking, riding, photography; recreation setting – what is possible)
  - Naturalness (e.g., roads that break up forest? Remoteness? Human presence previous grazing, ranching, timber, surrounding roads/noise/visual, fire, natural plant succession);
  - Does the area prevent incidental damage to ecosystems?
  - Is the species composition or succession appropriate for the area?
  - Are invasive species present and, if so, are they increasing or dominant in the area?
  - Does the area provide contiguous habitat for fish, wildlife, and flora?
  - Is motorized access present, and if so, how prevalent is it in the area?
  - Have natural processes been allowed to run their course without human intervention?

#### Special Features

Capability of providing outdoor education and scientific study, and abundant and varied wildlife.

- Education any unique features? Research natural areas (RNAs)?
- Scenic features e.g., views.

#### Manageability

Ability to manage as an enduring resource of wilderness, untrammeled by man, retaining primeval character; ability to protect and manage natural character (consider size, shape, juxtaposition to external influences, etc.).

- · Size, shape;
- · Boundaries;
- Avoids conflict with existing or potential public uses outside that might result in demands to allow nonconforming structures/activities in wilderness;
- Can readily/accurately describe, establish, recognize boundaries on ground;
- Conforms with terrain or other features that constitute a barrier to prohibited use;
- · Acts as shield to protect wilderness from sights/sounds of civilization; and
- Provides adequate opportunity for access and traveler transfer facilities.

#### **Availability**

FSH 1909.12-7.22 states that the determination of availability is conditioned by "the value of and need for the wilderness resource compared to the value of and need for other resources." To be available for wilderness, the values of the wilderness resource, both tangible and intangible, should exceed the value of other resources that formal wilderness designation would preclude.

The USFS should have sufficient control to prevent development of irresolvable, incompatible uses that would lessen wilderness character and potential. The effect that wilderness designation and management is likely to have on adjacent lands is also a necessary consideration in evaluating availability.

Lands generally unavailable for wilderness include land with or needed for:

- Increased water production and/or additional on-site storage (need is vital to public necessity and installation or maintenance of improvements would be incompatible with wilderness);
- Wildlife management measures (wilderness designation would restrict or prevent necessary actions);
- Highly mineralized areas (the strategic or economic importance and controls necessary to maintain the wilderness character of the land would not be in the public interest);
- Unique or outstanding natural phenomena (general public access and special development to facilitate public enjoyment may be necessary and incompatible with wilderness);
- Clearly documented resource demands (e.g., timber or mineral production, developed recreation areas such as winter sports sites); and
- Contractual agreements (lands committed for use, purposes, or activities that are incompatible with the Wilderness Act).

The following criteria were used to determine wilderness availability of each roadless area:

- Value of and need for wilderness resource compared to other resources (current use, outputs, trends, potential future use), control over surface/subsurface of area (private land plans), effect on adjacent lands (transportation systems – access/transfer facility requirements costs and locations);
- Recreation motorized, developed areas. What would need to be prohibited should it be wilderness (e.g., snowmobiling, mountain biking)? Level of uses, etc.;
- Wildlife special habitat? Sensitive species? Winter range/migration;
- Water availability and use snowfall, runoff;
- Livestock operations which allotments, stocked or improvements?
- Timber list past activities, suitable timber base, likelihood of being used;

- Minerals drilling since 1992 or likely to occur;
- Cultural resources past surveys and potential;
- Authorized and potential land uses special uses, access to private inholdings, proposed uses;
- Management considerations RNAs and Special Interest Areas (existing or proposed), effect
  that wilderness designation and management is likely to have on adjacent lands,
  motorized/mechanized use (where does it occur?), inholdings, fire (what limits would there be
  for prescribed fire, suppression or fuels management?), livestock grazing (limits on facilities),
  effects of limited trail maintenance, limits to address insect/disease, current inholding uses.

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? (Areas with vital need for increased water production/additional on-site storage, installation or maintenance of improvements);
- Would wilderness designation seriously restrict important wildlife management measures?
- Does the area have high strategic or economic mineral-development potential? (Highly mineralized areas of strategic or economic importance);
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? (Natural phenomena demonstrating need for public access and special development);
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports?
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation?

Of the 19 areas, 18 were found capable and available for recommended wilderness (see Table C.4 below).

#### Need

Areas determined to be both capable and available for wilderness were evaluated for the need for wilderness.

The need for an area to be designated as wilderness is determined through "an analysis of the degree to which it contributes to the local and national distribution of wilderness" (FSH 1909.12-7.23). For an area to be recommended for inclusion in the National Wilderness Preservation System, there should be clear evidence of current or future public need for additional designated wilderness of those characteristics. Need is evaluated in terms of the geographic distribution of areas, representation of landforms and ecosystems, and the presence of wildlife expected to be visible in wilderness. The following criteria were used to determine the wilderness need of each roadless area.

#### Social Need

#### Relation to Nearby Wilderness Areas and Urban Areas

The SJNF manages three wilderness areas – the Lizard Head, Weminuche, and South San Juan– and the Piedra Area. These areas total almost 750,000 acres, or a third of the total acres in the SJNF.

There are over 3.3 million acres of designated wilderness in the state of Colorado, much of which is high elevation mountainous areas. The state's largest wilderness area, Weminuche, is located in the SJNF.

The SJNF is located in the Four Corners area of the country in southwest Colorado. The region surrounding the SJNF includes southwest Colorado, northwest New Mexico, northeast Arizona, and southeast Utah. The largest population center surrounded by the SJNF is Durango, with a population of just under 14,000. Surrounding metropolitan areas in the nearby vicinity include Farmington, New Mexico (approximately 38,000), and the larger areas of Denver.

Table C.3 summarizes the wilderness opportunities available from these cities.

Table C.3: Acres of Wilderness Accessible from the Nearest Cities

Table C.D. Heres of		ssible from the Nea  Miles to	
City and State	2010 Population	Nearest SJNF Wilderness	Wilderness Areas within 100 miles*
Durango, CO	16,887	40 miles	Lizard Head (40 miles, SJNF) Weminuche (40 miles, SJNF) Mt. Sneffels (50 miles, Grand Mesa, Uncompahgre, and Gunnison National Forests) South San Juan (57 miles, SJNF) Uncompahgre (59 miles, Grand Mesa, Uncompahgre, and Gunnison National Forests) La Garita (63 miles, Gunnison and Rio Grande National Forests)
Farmington, NM	45,877	73 miles	Weminuche (73 miles, SJNF) Lizard Head (76 miles, SJNF) South San Juan (79 miles, SJNF) Mt. Sneffels (89 miles, Grand Mesa, Uncompanyer, and Gunnison National Forests)
Grand Junction,	58,566	90 miles	Adobe Town WSA (27 miles, BLM) Raggeds (58 miles, Gunnison and White River National Forests) West Elk (63 miles, Grand Mesa, Uncompahgre, and Gunnison National Forests) Maroon Bells-Snowmass (63 miles, Gunnison and White River National Forests) Flat Tops (78 miles, White River National Forest) Mt. Sneffels (81 miles, Grand Mesa, Uncompahgre, and Gunnison National Forests) Uncompahgre (88 miles, Grand Mesa, Uncompahgre, and Gunnison National Forests) Lizard Head (90 miles, SJNF)
Albuquerque, NM	546,537	*	None
Moab, UT	5,046	82 miles	Adobe Town WSA (63 miles) Mt. Sneffels (81 miles, SJNF) Lizard Head (82 miles, SJNF)
Denver, CO	600,024	*	Mt. Evans (27 miles, Arapahoe and Pike National Forests) Indian Peaks (37 miles, Arapahoe and Roosevelt National Forests) Lost Creek (38 miles, Pike National Forest) Ptarmigan Peak (43 miles, White and Routte National Forests) Eagles Nest (53 miles, Arapahoe and White River National Forests) Buffalo Peaks (69 miles, Pike and San Isabel National Forests) Hunter-Fryingpan (78 miles, White River National Forest) Sarvis Creek (80 miles, Routt National Forest) Collegiate Peaks (84 miles, Gunnison National Forest) Mount Zirkel (98 miles, Routt National Forest)

<sup>\*</sup> Other Wilderness areas are closer than those in the San Juan National Forest.

The Rocky Mountain Region of the USFS has approximately 4.8 million acres of designated wilderness within its jurisdiction (www.wilderness.net).

Current visitor use in SJNF wilderness includes the following:

- 36% of visitors to the three wilderness areas were considered local (within 2 hours of a wilderness trailhead). The other 64% were not local and came from 73 different zip codes.
- Trend in recreation visits in recent years has been fairly level with some areas remaining
  popular or growing such as the wilderness compartments with 14,000-foot peaks and other
  areas receiving less use. The recent drought and fires (2000–2004) lowered the overall visitor
  trend.
- The amount of visits has stayed between 80,000 and 120,000 for the past 10 years. Most of the visitors are white (97%) and are between 40 and 70 years old (70%), with 10% under 16 years old and the other 20% between 20 and 40 years old.
- Solitude can be measured by whether the visitor feels that the area is crowded. The average visitor to wilderness in the SJNF did not have a crowding concern (2.5 on a scale of 1–10, with 10 being crowded).

Population growth in the counties immediately surrounding the SJNF is estimated to increase anywhere from 1% to 2% over the next 25 years. For example, the La Plata County population, at 44,566 in 2000, is projected to almost double by the year 2030.

#### Social Considerations at a National Scale

Cordell and Teasley (1997) estimate in the 1994-5 National Survey on Recreation and the Environment that there were 40.4 million visits to wilderness in 1995. Visitor use of Wilderness Areas on National Forest System lands is forecasted to grow between 0.5% and 1.0% annually for the next 50 years

Southwest Colorado contains a wealth of opportunities for unconfined outdoor recreation on other types of lands, such as non-wilderness lands on the SJNF or other adjacent forests such as the Uncompanding or Rio Grande National Forests, and other federal lands such as Bureau of Land Management (BLM), state lands, and private lands.

#### **Biological Need**

Biological need evaluates the degree to which the area generally appears to be affected primarily by the forces of nature, and that may represent an ecotype under-represented in existing protected areas. Biological need consider such factors as the composition of plant and animal communities, the extent to which the area reflects ecological conditions that would normally be associated with the area absent human intervention. A review of plant series found on NFS wilderness lands in the Rocky Mountain Region identified alpine and spruce-fir vegetation as covering a high percentage of wilderness lands.

#### **Assumptions**

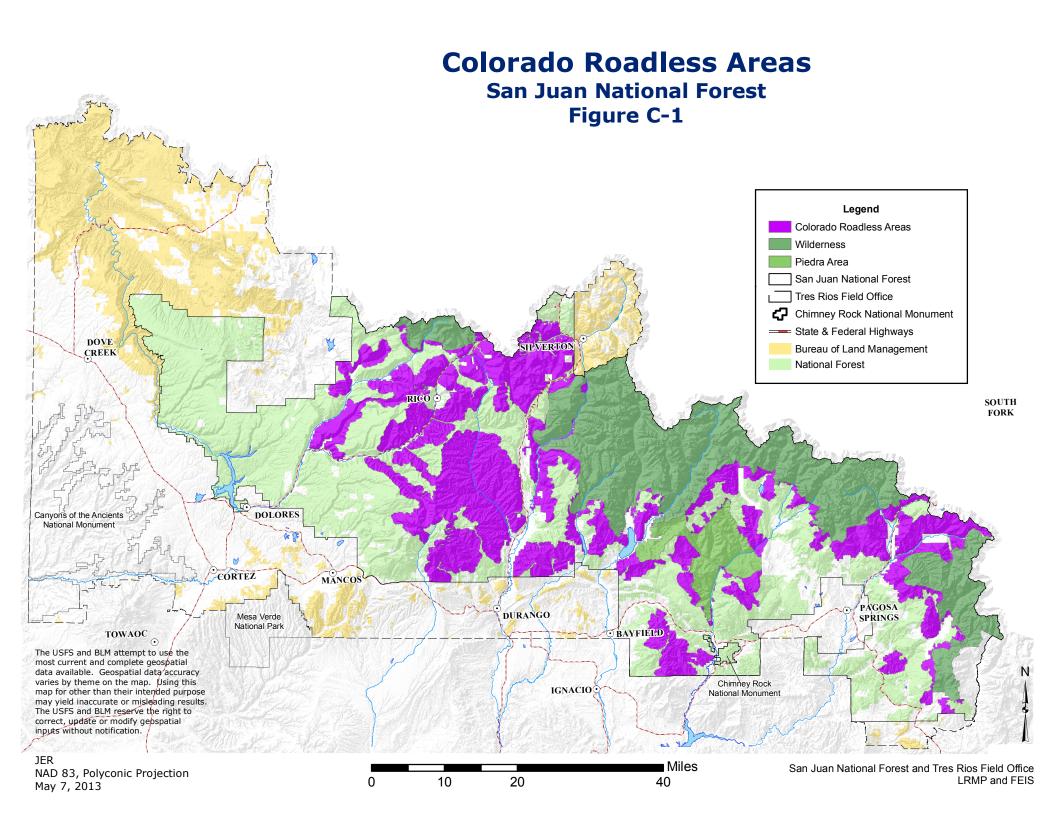
The USFS (FSH 1909.12) makes the following assumptions when evaluating the need for wilderness:

- Demand for wilderness increases with both an increasing population and a growing awareness of wilderness.
- Some undeveloped lands provide many opportunities for a primitive type of recreation outside wilderness. These lands are going to decrease in acreage as the demands on public lands increase.
- Some visitor use that occurs in designated wildernesses is not dependent on the wilderness
  environment.
- Within social and biological limits, management may increase the capacity of established wildernesses to support human use without unacceptable depreciation of the wilderness resource.
- To survive, some biotic species and/or associations may require the environment found only in a wilderness.

Table C. 4 provides a summary of the areas that met the available and capable criteria in the Wilderness analysis. Figure C-1 illustrates the Colorado Roadless Areas on the San Juan National Forest.

Table C.4: Roadless Areas found Available and Capable for Wilderness

Roadless Area Name	Acres	Adjacent Wilderness	Availability	Capable
Baldy	20,343	Weminuche	Available	Capable
Blackhawk Mountain	17,533	Lizard Head	Available	Capable
East Animas	16,854	Weminuche	Available	Capable
Fish Creek	13,533	Lizard Head	Available	Capable
Florida River	5,720	Weminuche	Available	Capable
Graham Park	17,808	Weminuche	Available	Capable
HD Mountain	25,044	Piedra	Not available	Not Capable
Hermosa	148,103	Lizard Head, Weminuche	Available	Capable
Lizard Head Adjacent	5,805	Lizard Head	Available	Capable
Piedra Area Adjacent	40,841	Piedra	Available	Capable
Runlett Park	5,615	Weminuche	Available	Capable
Ryman	8,665	Lizard Head	Available	Capable
San Miguel	64,263	Lizard Head, Weminuche	Available	Capable
South San Juan Adjacent	34,899	South San Juan	Available	Capable
Storm Peak	57,617	Lizard Head	Available	Capable
Treasure Mountain	22,500	South San Juan	Available	Capable
Turkey Creek	25,300	Weminuche	Available	Capable
Weminuche Adjacent	22,614	Weminuche	Available	Capable
West Needle	6,881	Weminuche	Available	Capable
Winter Hills/Serviceberry Mountain	5,115	South San Juan	Available	Capable



# CHAPTER 3 – SITE-SPECIFIC EVALUATION DESCRIPTIONS

The following site-specific descriptions were developed by updating the 1992 RARE descriptions from the 1992 EIS, staff and public input, and FSH 1909.12.

# BALDY (SJ309) (part of RARE II 2294) (CRA 309)

#### Overview

Acres: 20,343

District: Columbine

History: The RARE II study recommended that 15,200 acres of the 50,380-acre roadless area be added to the Weminuche wilderness, and those acres were added under the Colorado Wilderness Act of 1980. The remaining 35,180 acres were released for management purposes other than wilderness. The segment not recommended for wilderness had a low rating because of non-conforming uses, structures, and mineral activity that reduced the natural quality of the area.

Location and vicinity: The area includes much of the eastern flank of Missionary Ridge to the private land along the Florida River.

Access: Road access within 0.25 mile of the roadless area includes Burnt Timber Road 595, the Red Rim Road 076, and the East Animas, which is a La Plata County road. NFS trails that access and serve the area are Missionary Ridge Trail 543, Youngs Canyon Trail 546, Haflin Canyon Trail 557, North Fork Shearer Creek Trail 558, Lime Mesa Trail 676, First Fork Red Creek Trail 727, and Stevens Creek Trail 728.

Physical description: The area includes Missionary Ridge and is the southern exposure of a northward-slanting incline extending from the low valleys east of Durango up to the high ridge tops of the hydrological divide between the Animas River drainage and the area drained by the Florida River.

The elevation range is between 6,800 feet near Durango up to 10,500 feet on Missionary Ridge.

*Vegetation:* The vegetative cover varies with elevation and exposure. The ponderosa pine type at the lower elevations gives way to the large band of mixed conifer. Above the tree line the spruce and fir give way to the alpine tundra.

Soils: Rock types of the exposed geology are as varied as the landform. The west side is primarily layers of sedimentary rocks. The Florida drainage contains some metamorphic and granites and the Vallecito is represented by mostly igneous outcrops and cliffs. Soils are variable in terms of depth, texture and eroding character.

Wildlife: The wide variety in vegetative cover for feeding and hiding provides outstanding habitat.

There are many small tributaries in this RARE II area, most without fishery potential.

*Current uses:* Dispersed recreational activities are limited to day-use and/or pass-through activities by persons on their way to the wilderness. Big-game hunting is probably the primary activity. Hiking and mountain biking along the Missionary Ridge Trail and day hiking in the Baldy area are popular.

Surroundings: NFS and private lands adjacent to the area are used for a wide variety of values. There are housing developments, recreation and tourist facilities, and all manner of forest resource uses such as timber harvest, livestock grazing, wildlife habitat improvement, and water-related activities.

Key Attractions: Missionary Ridge

## Capability

#### Environment

Opportunity for solitude: Opportunity for solitude is moderate because of access and because of the shape of the areas and the numerous developments and activities along Lemon and Vallecito Reservoirs and the amount of road use on the adjacent areas. In some cases subdivision for home sites occurred right on the roadless area boundary.

*Naturalness:* Most of the Baldy area was cut during the turn of the century and has returned to a natural looking area.

Challenge: None known.

Outdoor recreation opportunities: Most of the area is closed to all types of motorized recreation.

#### **Special Features**

Much of the area burned during the Missionary Ridge fire of 2002. This 70,000-acre fire changed the vegetative structure of the area.

Education: None known

Scenic features: None known.

#### Manageability

Size: 20,343

Boundaries: The area has no logical link to other roadless areas. Since it has a common boundary with the Weminuche wilderness there is potential to add more area to the Weminuche. However, no logical boundary could be established for management and protection of the wilderness.

Conclusions: This area is capable as wilderness.

#### Availability

Recreation: See Overview.

Wildlife: See Overview.

Water availability and use: None known.

*Livestock operations:* The area contains active grazing allotments and few facilities such as livestock ponds and fences.

*Timber:* There are 916 acres of suitable timber lands, some in the Willow Creek drainage (per December 2005 Governor's roadless meeting materials).

Minerals: The area contains geothermal possibilities. Locatable minerals potential is low to non-existent.

The area contains low potential for oil and gas or coal and there are no existing oil and gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Some cultural resource inventory has taken place in the area. Survey data from surrounding areas indicate that sites are likely to be found in open parks and meadows and along drainages and near permanent water sources. Potential cultural resource sites existing on steep slopes and in dense timber stands are unlikely. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no timber sales planned in the area. Nor are there plans for any subsequent recreation or domestic range developments. There are mechanical fuel projects within the area and more are planned.

Management considerations: None known.

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Not known

Conclusions: This area is available as wilderness.

#### Need

The cover types represented in the Baldy roadless area are presented in Table C.5 below.

**Table C.5: Baldy Area Cover Types** 

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	107	21	17	797	19,089	0	20,032
%	0.5%	0.1%	0.1%	4.0%	95.3%	0.0%	100%

*Nearby wilderness:* The northern boundary of the East Animas roadless area is adjacent to the Weminuche wilderness.

Limited representation cover types: None known

Wildlife needs: None known.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

# BLACKHAWK MOUNTAIN (SJ012) (RARE 2304) (CRA 304)

#### Overview

Acres: 17,533

District: Dolores

History: The RARE II process identified 17,750 acres of roadless area that were not recommended for wilderness because of the combined effects of developments (mining, unimproved four-wheel-drive roads, range improvements). The 1983 LRMP allocated approximately half the area to semi-primitive non-motorized recreational opportunity, and most of the remaining to increased water yield through timber harvest. As of the 1992 LRMP amendment, 1,880 of the released acres were modified through subsequent resource management activities and 15,870 acres were to maintain their roadless character. The 2006 inventory increased the roadless acres to 17,533 through better geographic information system (GIS) mapping procedures.

Location and vicinity: This roadless area contains the area radiating out from the high ridge between Blackhawk Mountain, Section Point Peak, and Hermosa Peak. The area is located in both the Dolores and Animas Ranger Districts and is entirely within Dolores County. The western boundary is along the Dolores River. The north and south boundaries parallel Barlow and Scotch Creeks, respectively. The east boundary parallels the Hermosa Park Road.

Access: The area is accessible from Colorado Highway 145, the Barlow Creek Road 596, Hermosa Park Road 578, and Scotch Creek Road 550. The Colorado Trail 507 is the only NFS trail that accesses and serves the roadless area. There are non-system trails shown in the Rico town plan shown in this area.

*Physical description:* Numerous stream channels and ridges radiate in all directions from the high ridge formed by Blackhawk and Hermosa Peak. The area is highly dissected by the radiating stream channels.

The elevational range goes from 8,600 feet near Spruce Gulch to 12,681 feet on the summit of Blackhawk.

*Vegetation*: Vegetative overstory is the mixed conifer type with ponderosa-aspen mix in the lower elevations and aspen-white fir mix at the upper elevations. Depending on exposure there are pockets of Douglas-fir and spruce. Above the tree line on the three high peaks, the alpine tundra exists and is punctuated with cliffs and monolithic rock outcrops.

Soils: Parent geology is made up of sedimentary layers with shallow to deep, unstable soils.

*Wildlife:* Wildlife species inhabiting the area are typical of wildlife found in the southern Rocky Mountains. There is a good animal species mix because of the varied habitats created by the variety of understory vegetation. Lynx are known to exist in the area.

Current uses: The primary dispersed recreation use is hunting, hiking, and scenery viewing. The northern half and portions around Rico are open to cross-country motorized use. The Deadwood, Circle, and McJunkin non-system trails are used for non-motorized use. Winter use includes snowmobiling in the open area, backcountry skiing, and snowshoeing. Big-game outfitters use this area.

Surroundings: NFS lands surrounding the roadless area provide a variety of public values. The areas in the river and stream bottoms provide a scenic backdrop for recreation travel along the surrounding roads. The mining district around Rico is composed of many mining patents that could be reactivated in future years. Some summer home development is occurring on other private lands.

Key attractions: Blackhawk Mountain

## Capability

#### Environment

Opportunity for solitude: Opportunity for solitude is minimal because of the surrounding roads and the mining and townsite activity at Rico.

*Naturalness:* The area contains developments in the form of unimproved four-wheel-drive roads, mining, and range improvements.

Challenge: None known.

Outdoor recreation opportunities: Big-game hunting, outfitting, unimproved four-wheel-drive roads, snowmobiling, backcountry skiing, and snowshoeing.

**Special Features** 

Education: None known

Scenic features: None known

#### Manageability

Along Colorado Highway 145 is a utility corridor and dispersed parking for fishing and camping.

Size: 17,533

Boundaries: The area cannot be linked to other roadless areas or classified wilderness.

Conclusions: This area is capable as wilderness.

#### Availability

Recreation: See Current uses above.

Wildlife: Lynx are known to use the area.

Water availability and use: No known issues

Livestock operations: The area contains active grazing allotments and few facilities such as livestock ponds and fences.

*Timber:* There are 1,049 acres of suitable timber lands in the roadless area (per December 2005 Governor's roadless meeting materials)

*Minerals*: A small portion of the area, approximately 500 acres around Rico, is listed by the Department of Energy as very important for uranium. The area contains known quantities of hard rock minerals and geothermal potential. There presently is no known coal potential within the IRA.

Oil and gas potential is low. There are no existing oil or gas leases in the area (per December 2005 Governor's roadless meeting materials.)

Cultural resources: Cultural resource inventories have been conducted in some parts of the area. Some sites have been recorded during these inventories that include isolated finds, lithic scatters, and historic mining features. There is a moderate to high likelihood of additional sites occurring in open parks, meadows, and along stream courses. The likelihood of additional finds on the steep slopes and in the dense timber stands is low. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: Mining claims along with associated road construction or development of patented lands could compromise parts of the area.

Management considerations: Rico watershed and pipeline could impact the area.

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Yes, the Rico watershed and pipeline could impact the area.
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *Not known*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available for wilderness designation.

#### Need

*Nearby wilderness:* The northwestern tip of the Blackhawk Mountain roadless area is separated from the Lizard Head wilderness area by Colorado Highway 145.

*Limited representation cover types*: None known. The cover types represented in the Blackhawk Mountain roadless area are presented in Table C.6 below.

Table C.6: Blackhawk Mountain Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	2,637	21	0	1,157	13,712	6	17,533
%	15.0%	0.1%	0.0%	6.6%	78.2%	0.0%	100.0%

Wildlife needs: Lynx are known to use this area

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Recreation use, including mechanized travel, would be allowed while maintaining the semi-primitive motorized character of the area. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

The area would be manageable as wilderness.

# EAST ANIMAS (SJ010) (RARE 2302) (CRA 302)

#### **Overview**

Acres: 16.854

District: Columbine

History: RARE II recommended addition of 4,380 acres of the 18,220-acre roadless area to the Weminuche wilderness. The recommended area was added to the Weminuche by the Colorado Wilderness Act of 1980. The remaining acres were released to semi-primitive non-motorized recreation, wildlife management, and wood fiber production under the 1983 LRMP. The Missionary Ridge fire burned the southern portion in Bear Creek.

Location and vicinity: The northern boundary abuts the Weminuche wilderness. This roadless area lies between the Missionary Ridge Road and the private and NFS lands along the Animas River. Its western and northern boundary is in the Animas River corridor and its eastern boundary flanks the numerous timber sales on the slopes of Missionary Ridge.

Access: Road access to the area is via Missionary Ridge Road 682. Canyon Creek Trail is the only trail to access the area.

*Physical description:* The area is characterized by the steep slopes rising out of the Animas River Canyon, which is part of the overall slopes leading to the top of Mountain View Crest. Once out of the steep canyon walls, the area has a more moderate and constant rise in elevation. The area is highly dissected by numerous streams that are tributaries to the Animas River.

The elevational range is from 7,000 feet on Carson Creek up to 12,000 feet on the slopes leading up to Mountain View Crest.

*Vegetation:* The overstory vegetation cover is primarily mixed conifer with some ponderosa pine types in the lower elevations along the Animas River and spruce and fir in the areas approaching the tree line. Extensive aspen stands are found on the east side of the boundary.

Soils: The geology is displayed by numerous rock outcrops and rock cliffs. They are a mix of sedimentary and igneous origin. There is a wide variety of soil types, most of which are fairly unstable on the steeper slopes.

*Wildlife:* The area is rich in wildlife because of the wide variety of vegetation ranging from the dry ponderosa/Gambel oak type up through the aspen, spruce, and fir. Tank and Canyon Creek have a fair to good fishery. Lynx are a known threatened species inhabiting the area.

*Current uses:* Dispersed recreational use of the area is limited to hunting and hiking. The area does provide a scenic backdrop for viewing from U.S. Highway 550, the Durango-Silverton Narrow Gauge Railroad, and recreation traffic along the Missionary Ridge Road.

Surroundings: NFS lands to the east of the roadless area have experienced moderately heavy timber harvests in the past. The area also provides some livestock grazing. Wilderness is adjacent to the north. The Animas River corridor, to the west, is managed for dispersed recreation and scenic quality. The major feature of the corridor is the narrow gauge railroad and whitewater boating on the Animas River.

Key attractions: Animas River, Grass Hopper Creek, and Tank Mesa.

## Capability

#### Environment

Opportunity for solitude: Opportunities for solitude exist high away from the Missionary Ridge Road and not during hunting season since very few people utilize the steep slopes leading out of the Animas River Canyon.

*Naturalness:* The area is mostly natural with a few livestock projects, including fences, pipelines, and stock ponds. These are minor intrusions.

Challenge: None known.

Outdoor recreation opportunities: Dispersed recreational use is limited to hunting and hiking.

#### Special Features

Education: None known

*Scenic features:* Provides a scenic backdrop for viewing from U.S. Highway 550, the Durango-Silverton Narrow Gauge Railroad, and recreation traffic along the Missionary Ridge Road.

#### Manageability

Size: The area is large enough to be managed as wilderness and is adjacent to the much larger Weminuche wilderness.

Boundaries: The area cannot be logically connected to other roadless areas but could be added to the Weminuche wilderness.

Conclusions: The area is capable as wilderness.

#### **Availability**

Recreation: The area is closed to all summer motorized-vehicle use and rocky topography restricts most winter snowmobile use to existing roads outside the area's boundary. Currently snowmobiling happens in Tank, Bear Creek, Canyon Creek, and on Mountain View Crest there are snowmobiling intrusions into the wilderness.

Wildlife: Lynx are a known threatened species inhabiting the area.

Water availability and use: Livestock water facilities in the form of pipelines and stock ponds. These are minor intrusions.

Livestock operations: The area is in an active livestock allotment.

*Timber:* The area contains 2,364 acres of suitable timber lands (update per December 2005 Governor's roadless meeting materials). These suitable stands include aspen stands near the Missionary Ridge Road.

*Minerals:* Potential mineral resources, both locatable and leasable, are not considered significant and no exploratory activities are foreseen at this time.

There are currently no oil and gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Very little cultural resource inventory has been done in the area and no sites have been recorded. Based on data from surveys in surrounding areas, there is a moderate to high likelihood that sites exist along drainages and in open parks and meadows. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act. Historic features include cabins and a sawmill between Bear Creek and Canyon creek.

Authorized and potential land uses: There is limited potential for wildlife habitat improvement through prescribed burning, but no specific projects have been identified. There are no planned developed recreation sites. Roading of this area could occur because of unplanned mineral activity and oil, gas or coal leasing. Prescribed burn is planned between Bear Creek and Canyon Creek.

Management considerations: Private inholding, extensive adjacent road network.

#### Availability Questions:

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available for wilderness designation.

#### Need

Nearby wilderness: The northern boundary abuts the Weminuche wilderness.

The cover types represented in the East Animas roadless area are presented in Table C.7 below.

**Table C.7: East Animas Area Cover Types** 

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	979	395	14	1,232	14,227	17	16,864
%	5.8%	2.3%	0.1%	7.3%	84.4%	0.1%	100.0%

Limited representation cover types: None known

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Proposed management under all alternatives would protect wilderness characteristics while allowing for additional management tools not allowed under wilderness protection. Recreation use including allowing mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

The area is manageable as wilderness due to its adjacency the Weminuche wilderness, although the southern portion has a significant inholding and extensive adjacent road network that may hamper management of that portion as wilderness.

# FISH CREEK (SJ001) (not included in RARE II) (CRA 310)

#### Overview

Acres: 13,533

District: Dolores

History: The Fish Creek roadless area was not identified in previous roadless inventories.

Location and vicinity: This area is located in the northeastern part of the Dolores District, in Dolores County, southwest of, but not adjacent to, the Lizard Head wilderness. It is bounded by Little Fish Creek to the west and Fish Creek to the east; the area includes both drainages, spanning from Black Mesa south to the confluence of the two rivers.

*Access*: Points along the following roads are within 0.25 mile or less of the roadless area boundary: Forest Roads 452, 403, 611A, 404, 534, and 64.

Physical description: The area includes a variety of topographic features, including mountain peaks, mesas, deep canyons, steep valley slopes, and rolling high country. It is dissected by Fish Creek and Groundhog Creek, which are tributary to the West Dolores River. The area is characterized by Nipple Mountain, Fish Creek state wildlife area, and Willow Creek Divide. The area is bounded on the west by the SJNF boundary and on the east by the west Dolores Road.

The area's elevation ranges from 7,400 feet near the West Dolores River up to 9,763 feet at the Nipple Mountain summit.

*Vegetation*: The lowest elevations are covered with willow-dominated riparian zones and several small stands of old growth ponderosa pine. Aspen dominates the south-facing slopes while spruce-fir forests populate north-facing slopes.

*Soils*: Geology of the area is manifested by rock outcrops and cliffs of both sedimentary and igneous origin. The soil types vary widely and run the full range of instability from stable and shallow to deep.

*Wildlife*: Wildlife species found in this area are typical of those found in the southern Rocky Mountains. The large number of vegetative types has created an extremely diverse habitat. There are no known threatened or endangered species in the area.

*Current uses*: The Fish Creek Trail offers hiking, horseback-riding, hunting, and fishing. The western boundary is open to motorized use; part of it is F area down from Groundhog Creek. The Goble Creek area is open to snowmobiling and only the Fish Creek drainage is closed year-long to motorized use.

*Surroundings*: All immediate adjacent lands surrounding the Fish Creek roadless area are NFS lands. The SJNF boundary is located just over a mile west of the area and is bounded by private lands. Uncompanyere National Forest lands are 1 to 3 miles to the north of the roadless area. Lizard Head

wilderness is a few miles from the northeastern boundary of the Fish Creek roadless area. Lands south of the roadless area are a part of the SJNF. The Fish Creek state wildlife area is located less than a mile southwest of the roadless area.

Key Attractions: Fish Creek Trail

## Capability

#### Environment

Opportunity for solitude: Opportunities are low for most of the area, except on the Fish Creek Trail, due to snowmobiles, hunting, and sights and sounds from private lands.

*Naturalness*: The spruce forests of Black Mesa have been extensively clearcut above the stream valley rims. However, these clearcuts on Black Mesa and Willow Divide form the boundary of the roadless area. Livestock fences in this IRA are fairly intrusive in areas.

Challenge: Water users on Groundhog Creek, private lands on the west side of the IRA.

Outdoor recreation opportunities: The Fish Creek Trail (Forest Service Trail 647) begins in the Fish Creek state wildlife area before it enters SJNF lands, ending at the Black Mesa Road. Goble Trail (Forest Service Trail 740) is a non-motorized trail except for winter snowmobile. The trail is open to horses, hikers, and mountain bikes. Trout fishing occurs in Fish Creek and Colorado Parks and Wildlife (CPW) has created a fish habitat on the lower end.

#### **Special Features**

Education: None known

Scenic features: None known

## Manageability

Size: 13,533

Boundaries: The roadless area cannot be combined with any other roadless area. It is separated from the Lizard Head wilderness by Forest Road 611.

Conclusions: This area is capable as wilderness.

#### Availability

Recreation: Some winter snowmobile use in Willow Divide and Nipple Mountain. Unauthorized all-terrain vehicle (ATV) use occurs in the area. The IRA is used for pack trips for fishing and hunting big-game outfitters. Overall levels of recreation use are low off the main trails.

*Wildlife*: Fish Creek IRA has several major elk migration corridors between winter range to the southwest and summer range around the Lizard Head wilderness and contains elk calving areas.

*Water availability and use*: Groundhog Creek is the major outlet for Groundhog Reservoir. Fish Creek Trail has a ditch on NFS lands. The western side is littered with stock ponds and reservoirs.

*Livestock operations*: The area has livestock grazing use with numerous fences and stock ponds and reservoirs on the western side, but the only range developments consist of a couple of fences. There is a brush fence on the southern boundary of Mavreeso.

*Timber*: All previous timber sales were removed in the new inventory.

*Minerals*: The area lies outside known mineral-producing regions and has low potential for economic mineralization. The IRA has moderate oil and gas potential and low potential for coal. No other saleable minerals known in the area.

Cultural resources: None known

Authorized and potential land uses: None known

Management considerations: None known

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Yes, ditches and Groundhog Creek are used to transport water held in Ground Hog Reservoir.
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes, moderate potential for oil and gas.
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available as wilderness.

#### Need

Nearby wilderness: Lizard Head wilderness is a few miles northeast of the Fish Creek roadless area.

*Limited representation cover types*: None known. The cover types represented in the Fish Creek roadless area are presented in Table C.8 below.

Table C 8: Fish Creek Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
I	Acres	217	307	0	2718	10292	3	13,537
	%	1.6%	2.3%	0.0%	20.1%	76.0%	0.0%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive motorized character of the area.

The area would be difficult to manage as wilderness due to its shape (narrow neck, high perimeter/core area ratio), surrounding developments, and adjacent private and state lands.

# FLORIDA RIVER (SJ011) (part of RARE II 2294) (CRA 294)

#### Overview

Acres: 5,720

District: Columbine

History: The RARE II study recommended that 15,200 acres of the 50,380-acre roadless area be added to the Weminuche wilderness and those acres were added to the Weminuche wilderness under the Colorado Wilderness Act of 1980. The remaining 35,180 acres were released for management purposes other than wilderness. The segment not recommended for wilderness had a low rating because of non-conforming uses, structures, and mineral activity that reduced the natural quality of the area.

Location and vicinity: The area includes much of the eastern flank of Missionary Ridge to the private land along the Florida River.

Access: Road access within 0.25 mile of the roadless area includes Vallecito Road 600, East Florida Road 597, and Florida Road 596. NFS trails that access and serve the area include Endlich Mesa Trail 534.

Physical description: The area is characterized by U-shaped valleys of the Florida and Vallecito Rivers.

The elevation range is between 8,200 feet near Lemon Reservoir up to 12,740 feet at the summit of Miller Mountain.

*Vegetation:* The vegetative cover varies with elevation and exposure and is primarily a large band of mixed conifer. At the tree line the spruce and fir give way to the alpine tundra.

Soils: Rock types of the exposed geology are as varied as the landform. The west side is primarily layers of sedimentary rocks. The Florida drainage contains some metamorphic rock and granites and the Vallecito is represented by mostly igneous outcrops and cliffs. Soils are variable in terms of depth, texture, and eroding character.

*Wildlife:* The wide variety in vegetative cover for feeding and hiding provides outstanding habitat. Lynx, a threatened species, have been released in the area.

There are many small tributaries in this RARE II area, most without fishery potential. The inlet to Stump Lake was rehabilitated in 1987 as a fishery improvement project to try and maintain winter inflow. Success has been poor and future projects may be needed.

*Current uses:* Dispersed recreational activities are limited to day-use and/or pass-through activities by persons on their way to the wilderness. Big-game hunting is probably the primary activity.

Surroundings: NFS and private lands adjacent to the area are used for a wide variety of values. There are housing developments, recreation and tourist facilities, and all manner of forest resource uses such as timber harvest, livestock grazing, wildlife habitat improvement, and water-related activities.

Key attractions: Outstanding wildlife appreciation opportunities.

## Capability

#### **Environment**

Opportunity for solitude: Opportunity for solitude is moderate because of access and because of the shape of the areas, the numerous developments and activities along Lemon and Vallecito Reservoirs and the amount of road use on the adjacent areas. In some cases subdivision for home sites occurred right on the roadless area boundary.

*Naturalness:* While some of the area was cut during the turn of the century, it has returned to a natural-looking area.

Challenge: None known.

Outdoor recreation opportunities: Most of the area is closed to all types of motorized recreation. Only areas around Miller Mountain on the north end are open to motorized uses.

#### **Special Features**

Much of the area burned during the Missionary Ridge fire of 2002. This 70,000-acre fire changed the vegetative structure of the area.

Education: None known

Scenic features: None known

#### Manageability

Size: 5,720

*Boundaries:* The area has no logical link to other roadless areas. Since it has a common boundary with the Weminuche wilderness there is potential to add more area to the Weminuche. However, no logical boundary could be established for management and protection of the wilderness.

Conclusions: This area is capable as wilderness.

#### Availability

Recreation: See Overview above.

Wildlife: See Overview above.

Water availability and use: None known

*Livestock operations:* The area contains active grazing allotments and few facilities such as livestock ponds and fences.

*Timber:* There are 916 acres of suitable timber lands, some in the Willow Creek drainage (per December 2005 Governors roadless meeting materials).

Minerals: The area contains geothermal possibilities. Locatable minerals potential is low to nonexistent.

The area contains low potential for oil and gas potential or coal and there are no existing oil and gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Some cultural resource inventory has taken place in the area. Survey data from surrounding areas indicates that sites are likely to be found in open parks and meadows and along drainages and near permanent water sources. Potential cultural resource sites existing on steep slopes and in dense timber stands are unlikely. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no timber sales planned in the area, nor are there plans for any subsequent recreation or domestic range developments. There are mechanical fuel projects within the area and more are planned.

Management considerations: None known

#### Availability Questions:

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Not known

Conclusions: This area is available for wilderness designation.

#### Need

*Nearby wilderness:* The northern boundary of the Florida roadless area is adjacent to the Weminuche wilderness.

*Limited representation cover types*: None known. The cover types represented in the Florida River roadless area are presented in Table C.9 below.

Table C.9: Florida River Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	98	73	0	27	4,996	532	5,726
%	1.7%	1.3%	0.0%	0.5%	87.3%	9.3%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System.

Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

Management as wilderness would be complicated by the area's convoluted boundary, narrow "necks" of roadless land, and its adjacency to roaded areas and private property.

# GRAHAM PARK (SJ005) (RARE II 2291) (CRA 291)

#### Overview

Acres: 17,808

District: Pagosa

*History:* The RARE II process identified 12,090 roadless acres that were not recommended for wilderness because of the timber values and the absence of a logical manageable boundary. This area had the lowest wilderness attributes rating on the SJNF and was in the lower 50% in the region. The 1983 LRMP allocated the area to semi-primitive non-motorized recreation and 1,160 acres to timber production.

Location and vicinity: The Graham Park roadless area is a dipper-shaped area between the old Mosca timber sale area and the Weminuche wilderness. It is located in Hinsdale County in the north-central portion of the Pagosa District. Its top side is a common boundary with the Weminuche wilderness along the ridge between Granite and Graham Peaks. The eastern boundary is the private land in the Weminuche Valley and the south boundary is along the clearcut areas of the historic Mosca timber sale area.

Access: Roaded access to the area is via Piedra Road 631. The following NFS trails access and serve the area: Pine-Piedra Trail 524, Falls Creek Trail 673, Shaw Creek Trail 584, and Little Sand Creek Trail 591.

Physical description: The area's physical characteristics were formed by the high ridge separating the Weminuche drainage from the upper Los Pinos River drainage. This area covers the upper one-fourth of the slope between the Piedra River and the hydrological divide with the Pine River. Being near the top of the ridge, it is moderately dissected by cross-drainages and has three named streams draining the dipper portion of the area. They are Bear Creek, Shaw Creek and Falls Creek, which are tributaries to Weminuche Creek. The handle portion of the area contains the headwaters of Mosca Creek, Sand Creek, and the west and east forks of Coldwater Creek.

Elevational differences are between 8,200 feet in the Weminuche Valley and 12,531 feet on the summit of Graham Peak.

Vegetation: Although the exposure of the area is generally south and east, the dissecting stream channels have resulted in some north and southwest exposures. However, the change in exposure is not sufficient to create a large variety in overstory vegetation. The area has some mixed conifer types on the slopes rising out of the Weminuche Valley floor. Once the bench is reached in the Bear, Shaw, and Falls creeks area the timber type is in uniform stands of spruce and fir. Above the tree line on the higher peaks the alpine tundra is mixed with rock cliffs and talus slopes. One distinguishing characteristic is the number of open wet or riparian meadows along the upper reaches of Shaw and Falls Creeks. This unusual mosaic provides excellent elk summer habitat.

*Soils:* Geology of the area ranges from sedimentary outcrops in the Weminuche Valley to granitic formations that form the major peak along the Weminuche wilderness boundary. Soils vary.

Wildlife: Wildlife species inhabiting the area are typical of those found in the rest of the San Juan Mountains. In addition to the typical species there are Rocky Mountain bighorn sheep that frequent the areas around the higher peaks. The wet meadows in the Shaw and Falls Creek drainages are important elk summer ranges. The outstanding wildlife feature is the elk use of the Shaw and Falls Creek drainage areas for calving.

There are no known threatened or endangered species in the area. Suitable habitat for the Canada lynx exists in the IRA. Lynx have been released in a nearby area through the CPW lynx augmentation program.

Currently there are efforts to recover Colorado river cutthroat trout.

*Current uses:* Recreational use of the area is mostly hunting. Some trail use occurs by horse packers and backpackers using system and non-system trails for hunting. Recreation use is very low outside the hunting season. The area is a prime spot for observing wildlife. The area is closed to summer motorized travel, but snowmobiling is permitted off FDR 631 in winter.

*Surroundings:* The eastern boundary is the private land in the Weminuche Valley and the south boundary is along the clearcut areas of the historic Mosca timber sale area. Use of lands surrounding the area is varied. On the north and west is legislated wilderness, on the east is private ranching and on the south and southwest are the old Mosca clearcuts with their associated road system.

Key attractions: Views of the Weminuche wilderness

# Capability

#### Environment

Opportunity for solitude: Low to moderate. The area slopes down to intensive development (clearcuts, roads), which can be seen from much of the area; however, recreation use is low except during hunting season.

Naturalness: 1980s timber harvest and road construction.

Challenge: None known.

Outdoor recreation opportunities: See Overview.

Special Features

Education: None known

Scenic features: See Overview.

## Manageability

Size: 17,808

Boundaries: No known issues

Conclusions: This area is capable as wilderness.

#### **Availability**

Recreation: See Overview.

Wildlife: See Overview.

Water availability and use: Fens are located in the area.

*Livestock operations:* The current level of livestock grazing is expected to continue with only the ranching economy causing any major changes. Existing range improvements will be maintained.

*Timber:* One timber sale has affected the area since the RARE II study and analysis. The Mosca timber sale area modified the roadless character on approximately 920 acres. The 1.8 miles of new road to connect the scattered cutting blocks also impacted another 80 acres.

In total, there are 3,225 acres of suitable timber lands (per December 2005 Governor's roadless meeting materials).

*Minerals:* Previous energy resource assessments show that no commercial potential exists for oil and gas, locatable, and coal on the entire area. No known leases are in effect at this time.

Cultural resources: Previous cultural resource surveys in the area resulted in the location of only a few sites of isolated artifacts and lithic scatter. These sites were located in meadows, thus indicating likely site locations in the upper Piedra Valley. There is a moderate likelihood of sites being present in meadows and along drainages. The likelihood is lower for the steep slopes and dense tree-covered areas. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are two outfitters and guides in the area with two camps and a potential Sno-Cat skiing proposal. Although Falls and Bear Creeks contain fish, it is doubtful whether any fisheries habitat improvement will occur because of difficult access.

Management considerations: None known.

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available for wilderness designation.

#### Need

*Nearby wilderness:* The Graham Park roadless is adjacent to the Weminuche wilderness along its western and northern boundaries.

Limited representation cover types: None known. The wet meadows and fens are an uncommon feature that enhances the higher, rocky slopes of the adjacent Weminuche wilderness. The cover types represented in the Graham Park roadless area are presented in Table C.10 below.

Table C.10: Graham Park Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	986	834	32	737	15,209	10	17,808
%	5.5%	4.7%	0.2%	4.1%	85.4%	0.1%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

## HD MOUNTAIN (SJ009) (RARE II 2295) (CRA 295)

### Overview

Acres: 25,044

District: Columbine

History: The RARE II process recommended that the entire 20,010 acres of the roadless area remain non-wilderness. The 1983 LRMP allocated 2,800 acres to semi-primitive non-motorized recreation, 4,570 acres to semi-primitive motorized recreation, and 12,640 acres to wildlife management emphasis. The HD Mountains are covered under the Northern San Juan Basin EIS (USFS 2007), which addressed oil and gas development within the area.

The RARE II wilderness attribute rating was ranked in the lower 40% of the SJNF's areas and about midway in the regional areas. In total, 460 acres have been modified by management activities. Roads, pipelines, and drill sites for the gas field development will modify another 1,000 acres. At the conclusion of the 1992 planning period approximately 18,550 acres (29 square miles) were to remain roadless but the development of the gas field continues.

Location and vicinity: The HD Mountain roadless area is located to the southeast of Bayfield. It is partially located in four townships in both Archuleta and La Plata Counties. The area is located south of U.S. Highway 160. The area has an irregular boundary that generally inscribes the mountain ridge that separates the many old roads and timber-cutting areas on the eastern and western flanks of the HD Mountains.

Access: Access roads leading to the area include Sauls Creek 608, Lange Canyon 137, Fosset Gulch 613, Turkey Creek Road 615a, Radio Tower Road 756, ATT Road 743, and Spring Creek 537. The only NFS trail serving the area is the Pine-Piedra Trail 524.

*Physical description:* A 10-mile-long north-south low mountain range made up of individual peaks, mesas, and questas characterizes this roadless area. It is a transition area between the geomorphology of the Colorado Plateau and the higher Rocky Mountains along the Continental Divide.

Elevation range is between 6,500 feet in Skull Creek and 8,936 feet on Pargin Mountain.

*Vegetation:* Vegetation lies in a vegetative transition zone between the pinyon-juniper type and the ponderosa pine type. Pinyon-juniper, ponderosa pine, and mixed conifer dominate the southern exposures and ponderosa pine is present on the northerly exposures. Large Gambel oak stands are

along the western side of the area. Gambel oak is intermingled beneath the ponderosa pine and at the lower elevations of the pinyon-juniper type. There are a large number of open grass meadows in the drainage bottoms. On the northern exposures there are some pockets of Douglas-fir. Old growth ponderosa pine stands are in Turkey Creek and Ignacio Canyon.

Soils: Major geology of the area is formed by sedimentary rock formations and their resulting soil types. Many of the soils are considered poor and highly susceptible to erosion. Many are of shale origin and have a moderate to high shrink characteristic and are of low strength.

*Wildlife:* During the winter months, elk migrate into the area because of the large amount of winter range provided by the open grassy meadows. There is also a fair number of cavity-nesting birds because of the number of old ponderosa pine snags in the area.

The area has suitable habitat for the peregrine falcon and the Mexican spotted owl, a species is listed as threatened both federally and by the State of Colorado.

Current uses: Although a full spectrum of recreational activities exists in the area such as hiking, mountain-biking, horseback riding, and ATV use due to the area's location near Bayfield, recreation use is considered moderate because of the absence of water, vegetation, and terrain. Coalbed methane extraction, private lands holdings, and cattle grazing are in the area

*Surroundings:* The use of NFS lands surrounding this roadless area has long provided for multiple-use management of timber, range, wildlife, and recreation resources.

Key attractions: Turkey Creek, Ignacio Canyon, and Point Stewart.

## Capability

### Environment

Opportunity for solitude: Opportunity for solitude is available within parts of the area, but in some areas solitude is lacking because of the visual and audible impact of the gas-field production areas and related traffic on the surrounding roads. If all approved gas wells were constructed it would impact opportunities for solitude within the IRA.

Naturalness: The largest impact to the roadless character of the area is the current leasing and current and future drilling activity associated with the gas wells in this region of the San Juan Basin. Once the approved wells are drilled, this activity will change the natural setting of much of the IRA area. A small portion of the Lange Canyon timber sale has modified the roadless character of the area on approximately 80 acres. There were no new roads constructed for this 1981 sale. Several range fences cross the area and small stock ponds can be found in the lower, open draws on the area's periphery.

Challenge: None known.

Outdoor recreation opportunities: Hiking, mountain-biking, horseback riding, hunting, and ATV use.

### **Special Features**

Education: Old growth ponderosa pine stands in Ignacio Canyon have been identified as a potential RNA.

Scenic features: Pargin Mountain.

### Manageability

Size: 25,044

Boundaries: The roadless area cannot be linked to another roadless or wilderness area.

Conclusions: This area is not capable as wilderness.

## Availability

Recreation: Dispersed recreation in the form of hiking, hunting, mountain biking, and ATVs.

Wildlife: The area has suitable habitat for the peregrine falcon and the Mexican spotted owl.

Water availability and use: Springs and small stock ponds are found in the area.

*Livestock operations:* Grazing allotments cover much of the HD Mountains, although the utilized area is relatively small because of topographic limitations.

*Timber:* There are no planned timber sales within the area. There are 3,638 acres of suitable timber lands within the area (update per December 2005 Governor's roadless meeting materials), including portions of Ignacio Creek. However, topography limits utility of the area for timber management.

Minerals: Coalbed methane, natural gas, and other hydrocarbons offer the largest substantial extractive resource.

In 1978 the Department of Energy listed the entire area as being highly important for oil and gas. The Colorado Geological Survey also pointed out high oil and gas potential, as well as coalbeds underlying the entire area. These early studies are corroborated by the large interest in leasing and drilling expressed today.

The largest impact to the roadless character of the area is the leasing and current and future drilling activity associated with the gas wells in this region of the San Juan Basin. Currently, there have been two wells drilled on the boundary and four drilled in the interior, resulting in approximately 2.5 miles of road construction. The road construction has modified the roadless character of approximately 380 acres along the roads. As of December 2005, 17,388 acres (88%) within the HD Mountain roadless area are leased for oil and gas development.

The 2007 Northern San Juan Basin Record of Decision approved 138 gas wells within the area.

Cultural resources: Cultural resource inventories conducted in the area have identified a large number of properties that include isolated finds, Archaic campsites, lithic and ceramic scatters, habitations with subsurface architecture, and a large number of historic features relating to the logging and ranching era. Some of these properties will be eligible for the National Register of Historic Places. There is a high probability of finds on the ridge or mesa tops, in the meadows, and along the intermittent stream drainages. They are less likely to be found on the steep wooded slopes. Although this area is adjacent to the Southern Ute Reservation, tribal officials have not indicated any areas of interest under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no planned recreation developments in the area. The large impact will be the continued drilling for gas and oil for valid existing leases. Gas well development is expected in the area per the 2007 EIS Record of Decision.

Fuel/Forest restoration projects with both mechanical treatment and prescribed fire are ongoing and proposed in the area.

Management considerations: Authorized oil and gas leases have a direct impact on availability of the IRA.

### Availability Questions:

- Is the area vitally needed for increased water protection and storage? *Not known*
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No

- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? Yes, natural gas is a strategic energy resource located within the area.
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Yes, most of the area is leased for oil and gas.

Conclusions: The HD Mountains IRA is not available for wilderness designation.

Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

### Need

Conclusions: Lack of availability for wilderness precludes the need for this section.

## HERMOSA (SJ014) (RARE 2306) (CRA 306)

### Overview

Acres: 148,102

District: Dolores/Columbine

History: The RARE II process identified 146,105 acres that were not recommended as wilderness because of mineral activities and recreational needs. There was a strong public sentiment to keep the area roadless but not stop historic, high-demand recreational activities such as motorcycling and mountain biking. The 1983 LRMP allocated the area mainly to semi-primitive non-motorized recreation opportunity. The remaining portion of the area that had very low wilderness attributes and was allocated under the 1983 LRMP to a variety of management prescriptions, including semi-primitive motorized recreation, roaded recreation in a rural setting, wildlife, livestock use, and wood fiber production. As of the 1992 LRMP amendment, of the 146,105 released acres, 3,720 acres had been modified through resource management practices and 142,385 acres were roadless. The Hermosa drainage had a high wilderness attributes rating and met all other criteria for wilderness. No activities that would change or modify the roadless character had occurred in the main Hermosa drainage, with the exception of the Dutch Creek Area, which had some timber harvest occurring and was thus found unsuitable at that time. The 2006 inventory increased the roadless acres to 148,139 by combining the Hermosa and La Plata roadless areas and using better GIS mapping procedures.

Location and vicinity: This is the largest of the roadless areas on the SJNF. The area is located in portions of 12 townships in the central part of the SJNF. Most of the area is in La Plata County, but the western portions fall into Montezuma County. The irregular boundary is caused by roads that penetrate into the general area and deep narrow valleys like Bear Creek that have remained unroaded. The area is totally surrounded by NFS lands and private lands in the corridor along U.S. Highway 550. The nearest existing designated wilderness is located across the Animas River valley.

Access: The area is within 0.25 mile or closer to 13 NFS roads, U.S. Highway 550, several four-wheel-drive roads, and one private mining road. Some of the roads actually penetrate the existing RARE II boundary. The area is served by the following major NFS trails: Hermosa Creek 514, Little Elk 515, Goulding Creek 517, Jones Creek 518, Big Bend 519, Corral Draw 521, Neglected Trail 547, South Fork 549, Highline 520, Grindstone 658, Bear Creek 607, Little Bear 609, Gold Run 618, Rough Canyon, Grindstone Loop, Rio Lado 736, Sharkstooth, West Mancos 621, Morrison, Owens Basin, Dutch Creek, Salt Creek, Big Lick, Clear Creek, and Pinkerton-Flagstaff. The Rico/Silverton toll road is located in the northern part of the roadless, historical feature. The IRA contains a portion of the Colorado Trail, which is a system of trails connecting Durango with Denver.

*Physical description:* The area's physical characteristics range from flat to vertical cliffs and alpine peaks. The IRA has numerous perennial and intermittent stream drainages that flow into Hermosa Creek and whose canyons dissect the surface of the area.

The elevation ranges between 7,000 and 13,200 feet.

*Vegetation:* The wide range of elevations, slope aspects, and soil and geology types has resulted in an extremely complex mixture of plant communities. At the lower elevations, outstanding groves of old growth ponderosa pine and oak woodland dominate the vegetative type. As elevation increases, a transition to fir-aspen (mixed conifer) occurs and then on to a spruce-aspen complex. Douglas-fir is found on the northern aspects throughout the mixed conifer type. The higher elevations, near the tree line, have spruce-fir forest. Interspersed throughout the forested areas are open grassland parks and occasional wet meadows.

*Soils:* The highly dissected valleys also have a wide variety of surface geology. Soil types, depths, and erodibility vary widely. Every slope aspect (exposure) on the compass exists somewhere in the roadless area.

Wildlife: Wildlife species that inhabit the area are typical to the southern Rocky Mountains. Wildlife habitats are extremely varied because of the large elevational change and resultant numerous vegetative types present. The higher elevations of this area provide excellent summer habitat for elk. The Hermosa drainage has long been known for its quality habitat for elk calving and summer range. The edges of the roadless area are crossed by several major migration routes connecting the summer range areas with winter ranges in the lower country outside the roadless area and the SJNF.

Lynx and peregrine falcon, federal endangered species, inhabit the area. The Colorado River cutthroat trout occurs in Hermosa Creek, Rio Lado, and its tributary streams.

Current uses: The entire area provides a broad spectrum of recreational activities. The Hermosa drainage has long been a special area for recreationists to enjoy activities in a natural setting that would be prohibited in classified wilderness. Although managed for semi-primitive non-motorized recreation opportunity, the area has a system of trails, some of which are designated open to motorcycles and/or ATVs. In more recent years mountain bike use has become the leading recreation use. Water-related recreational activities are mainly stream fishing and enjoying the stream area environment. Outfitting and guiding and fall hunting are primarily the dispersed uses off-trail.

The Bear Creek drainage and associated trails provide a wide opportunity for most uses, including motorized (motorcycling and snowmobiling) hiking, horseback riding and packing, hiking, mountain biking, goat packing, fishing, backcountry skiing, and snowshoeing. Outfitters and guides use upper Bear Creek for hunting opportunities.

Surroundings: The NFS lands surrounding this unroaded area are managed for a wide variety of recreational and commodity uses. The area has no logical tie with existing wilderness. The nearest other roadless area is Ryman but it is separate because of the roads constructed between the two areas. Timber sales and associated roads penetrate the edges of Hermosa in the Dutch Creek area, in the upper Mancos River watershed west of Hesperus Peak, and at the upper end of the Junction Creek Road.

Key attractions: Largest IRA in Colorado, Hesperus Mountain, Hermosa Creek.

# Capability

### Environment

Opportunity for solitude: Lower Bear Creek Trail has low opportunity for solitude while upper Bear Creek is moderate. There is high opportunity for solitude off-trail in the Hermosa drainage except during hunting season. The Hermosa trail has low opportunity due to the motorized use and mountain bikes.

*Naturalness:* There have been some prescribed burns for wildlife habitat improvement in the area, but they do not materially affect the roadless character. The area includes several range developments including reservoirs, ponds, corrals, spring developments, and allotment fences.

Mining development is found off of Sharkstooth Trail.

Challenge: Nothing listed.

Outdoor recreation opportunities: More than 125 miles of trails cross the roadless area. However, other than Hermosa Creek, the extensive trail network receives low levels of recreational use other than during hunting season. The popular Hermosa Trail is open to all forms of backcountry recreation, including hiking, horses, mountain bikes, motorcycles, and ATVs. Ten tributary trails branch off from the main Hermosa Trail and offer access to several more remote valleys. The Hermosa Creek Trail serves as one of the most popular and scenic mountain bike routes in Colorado. A trail descends from the IRA boundary on the ridgeline, down along Bear Creek to the Dolores River. Travelers can traverse from the Animas to Dolores Rivers, over the crest of the La Platas, without crossing a road or otherwise encountering signs of civilization.

The Colorado Trail runs along Hermosa-Dolores Divide.

#### **Special Features**

The proposed Hermosa RNA lies in the Southern San Juan Mountains about 13 miles north of the town of Durango on 8,000 acres at elevations ranging from 7,000 to 12,000 feet. The area is characterized by highly dissected mountain topography and sedimentary geology. Key features include old growth forests, Colorado cutthroat trout, alpine tundra, spruce-fir forests, aspen forests, ponderosa pine forests, mixed conifer forests, and mountain shrublands.

Education: Hermosa RNA is recommended within the IRA.

Scenic features: The area has high scenic values from its undisturbed nature and high alpine peaks.

## Manageability

The entire area would be manageable but keeping visitor use along the major trails and restricting mechanized and motorized use off of the Hermosa Creek Trail would be difficult.

Size: The IRA is 148,102 acres, the largest in Colorado.

Boundaries: The plan proposes to change the boundary to the west side of Hermosa Creek with the southern boundary starting at Hermosa Creek following ridge line between Clear Creek on the north and Buck Creek on the south to the intersection with IRA boundary below Forest Road 171 below Monument Hill. The proposed boundary follows the IRA to Diorite Peak then follows the La Plata/Montezuma County line to Spiller Peak then follows a ridge line down to the South Fork of West Mancos River and contours around Hesperus Mountain at 10,600-foot elevation to the North Fork of West Mancos River and follows the IRA line north to Bear Creek Canyon (halfway along the Section 4 and 9 section line Township 37 North, Range 11 West) crossing Bear Creek staying east of a private land inholding and following Grimstone Trail East 608 to join the IRA boundary. The proposed boundary follows the IRA north from the Grimstone Trail/Colorado Trail intersection to the ridge south of Hotel Draw then follow that ridge east to Hermosa Creek then follows Hermosa Creek or the Hermosa Creek Trail 514 south staying west of the trail to the ridge between Clear Creek and Buck Creek.

Conclusions: This area is capable as wilderness. However, the proposed wilderness boundary is more manageable because it does not include most motorized trails, a majority of the outfitter camps, livestock improvements including a cabin on the northern and eastern side of the IRA, and omits high risk wildland urban interface fire zones on the southern end of the IRA. The proposed boundary also adds a 30-year-old timber sale that has been regrown on the northern end that enhances the manageability.

### Availability

Recreation: Described in Capability section, above.

*Wildlife:* Wildlife species that inhabit the area are typical to the southern Rocky Mountains. Wildlife habitats are extremely varied because of the large elevation changes and resultant numerous vegetative types present. The higher elevations of this area provide excellent summer habitat for elk. The Hermosa

drainage has long been known for its quality habitat for elk calving and summer range. The edges of the roadless area are crossed by several major migration routes connecting the summer range areas with winter ranges in the lower country outside the roadless area and the SJNF.

Lynx and peregrine falcon, federal endangered species, inhabit the area. The Colorado River cutthroat trout occurs in Hermosa Creek, Rio Laud, and its tributary streams.

Water availability and use: Unknown

Livestock operations: The current level of livestock grazing is expected to continue and existing range improvements will be maintained and/or upgraded when needed. There are a fair amount of livestock improvements along the east side, including reservoirs, springs, stock ponds, fences, cabins (three) Albert Park, Little Elk, and Goulding Creek cabins. Most of the brush fences built in the 1970s have deteriorated (27 miles in 2 years).

*Timber*: There are 6,973 acres of suitable timber lands in the area (per December 2005 Governor's roadless meeting materials).

Minerals: Portions of the area in and around the La Plata Mountains are mineralized and have current ongoing prospecting and mining operations. Mineral potential for the Hermosa Drainage portion is low and there are no known mineral development activities. From the Deadwood Creek RNA evaluation (1996): An active mine occurs on the slope above Deadwood Creek about 0.3 mile north of the southern boundary. The southernmost extensions of the roadless area into the high peaks of the La Plata Mountains, south of Kennebec Pass, contain a number of patented mining claims.

There are currently no oil and gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Previous cultural resource surveys within the area have identified numerous artifacts and properties, some of which are likely to be eligible for the National Register of Historic Places. The properties include both historic and prehistoric resources. They range from isolated finds and lithic scatters to historic mines and structures. The predictability of further survey finds is high to moderate in the level areas and stream bottoms and low in the heavily timbered areas and steeper slopes. The La Plata Mountains on the south side of the area are known to be an area of special interest to the Navajos. From Hope Creek RNA evaluation (1996): There are numerous records of historic and prehistoric cultural finds from the vicinity of Hope Creek (Colorado Historical Society records). The finds include aspen art, culturally significant trails, stone tools and tool-making artifacts, and remnants of early European settlement.

Authorized and potential land uses: There are no planned recreation developments for the area. The existing trail system within the area will continue to be maintained and rehabilitated as funds become available.

Management considerations: The southernmost portion of the roadless area extends into the high peaks of the La Plata Mountains and contains a number of patented mining claims and associated jeep trails. The Hermosa Trail and Colorado Trail receive substantial mechanized recreation use, largely in the form of mountain biking.

### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? There are 35 private holdings within the IRA and most of these are mineral patents.
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*

• Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known* 

Conclusions: This area is available for wilderness designation.

#### Need

*Nearby wilderness:* The Lizard Head wilderness is just over 10 miles north of Hermosa's northern boundary. The Weminuche wilderness is less than 5 miles from the eastern portion of the Hermosa roadless area.

Limited representation cover types: Old growth ponderosa pine is an under-represented ecosystem type in Region 2's wilderness system. Hermosa includes some of the finest quality old growth ponderosa pine left in the San Juan Mountains and in the state of Colorado. The cover types represented in the Hermosa area are presented in Table C.11 below.

Table C.11: Hermosa Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
	Acres	9,820	1,847	623	9,104	126,740	5	148,139
	%	6.6%	1.2%	0.4%	6.1%	85.6%	0.0%	100.0%
Recommended	Acres	5,223	333	205	2,843	42,242	4	50,850
for Wilderness	%	10.3%	0.7%	0.4%	5.6%	83.1%	0.0%	100.0%

Wildlife needs: Being such a large roadless area, there are benefits to wildlife.

Conclusions: As it is likely the largest remaining NFS roadless area in Colorado, this area would add significantly to the National Wilderness Preservation System. The Hermosa watershed and dendritic drainage pattern offers extraordinary opportunities for backcountry non-motorized travel and provides an alternative to heavily used routes in nearby wilderness areas such as the Weminuche. There are currently opportunities for mountain biking, motorcycle, and ATV use within this IRA. The Hermosa roadless area provides a corridor between the two river drainages and a link in the landscape between the Weminuche wilderness and lower elevations along the San Juan Mountains' western perimeter.

Regardless of Congressional action to designate the area as wilderness, management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

The proposed wilderness boundary, as mapped in the LRMP, would be manageable as wilderness.

# LIZARD HEAD ADJACENT (SJ018) (RARE II 2235) (CRA235)

### **OVERVIEW**

Acres: 5,805

District: Dolores

History: Of the original 17,440 acres identified in the RARE II process as a roadless area, 12,500 were added to the Lizard Head wilderness by the Colorado Wilderness Act of 1980. The remaining 4,940 were managed without modification and received a relatively low wilderness attribute rating in the RARE II process because of their location along the highway and West Dolores Road and because of mineral activities. Those lands were allocated to recreation and wildlife management emphases. At the conclusion of the 1992 planning period approximately 4,940 of the released acres (7.7 square miles) were to remain unroaded.

Location and vicinity: This area is adjacent to the southern boundary of the existing Lizard Head wilderness, west of Colorado Highway 145 near Lizard Head Pass in the Dolores District in Dolores

County. The current roadless area consists of approximately 5,000 acres immediately south of the present wilderness boundary and north of Colorado Highway 145. (Congress designated the Lizard Head wilderness under the Colorado Wilderness Act of 1980.)

Access: The area is accessible via Colorado Highway 145, Black Mesa Road 611(secondary Forest Road), and West Dolores Road 535 (primary Forest Road). Access to the area from the nearby roads is the Cross Mountain Trail 637, Burro Bridge Trail, Kill Packer Trail 203, Groundhog Stock Driveway 634, and Navajo Lake Trail 635.

*Physical description:* Toe slopes extend southward from the Mount Wilson massif. The toe slope is only moderately dissected by Slate Creek, Coke Oven Creek, and the West Dolores River, three tributaries to the Dolores River. The elevation range is 9,400 feet on the West Dolores River to nearly 11,200 feet near Lizard Head Creek.

*Vegetation:* Spruce-fir is the only significant overstory vegetative type. Riparian habitat and open grassy meadows are the other predominant site types. There are isolated patches of aspen in the West Dolores River drainage.

Soils: The geology is of igneous origin resulting when the Wilson Mountains were thrust up through sedimentary formations. The soils are the result of the disintegration of the Mancos Shale, Dakota sandstone, and McElmo sedimentaries and vary from clay to sandy loam. Most of the soils are shallow and easily eroded.

Wildlife: Wildlife species that may inhabit the area are those that are common and typically found in the southern Rocky Mountains. Diversity in wildlife habitat is high because the roadless area is a narrow band with a variety of meadow and forest types. Coke Oven Creek and Slate Creek have marginal fishery value and will probably not be locations for future fishery habitat projects. Little Fish Creek and Meadow Creek are marginal because of their steep gradients and low flows. The area contains lynx habitat.

Current uses: The area has several trails crossing from the highway over to the Lizard Head wilderness. Most recreation use is hunting or casual hiking from Colorado Highway 145. The area along the highway provides ample opportunity for sledding, backcountry skiing, and snowshoeing in the winter. Mountain biking is gaining popularity along the Groundhog Stock Drive, as are hiking and horseback riding. There is dispersed camping next to vehicles along the West Dolores Road and the east side of Forest Road 611. The area next to Lizard Head Pass is open to snowmobiling. Roads are closed on the south and west side of Lizard Head IRA.

*Surroundings:* NFS lands to the south and west are managed for a wide variety of recreational and commodity uses. The adjacent area on the north side is the Lizard Head wilderness, managed according to the dictates of the 1980 Wilderness Act.

Key attractions: Key attractions include fall foliage (aspens and as viewed across Colorado Highway 145), view of fourteeners (El Diente Peak and Mount Wilson) in Lizard Head wilderness.

# Capability

### Environment

Opportunity for solitude: Opportunity for solitude is quite low because of the highway traffic and noise along Colorado Highway 145 and high as one moves west along Groundhog Stock Drive.

*Naturalness:* The sight and sound of traffic on Colorado Highway 145, Meadows Road, and Road 611 (from Dunton) influences the natural feel of the area. The unroaded character of the area has not been impacted by any management activities in recent years.

Challenge: Snowmobile use in the area.

Outdoor recreation opportunities: Slate Creek and Meadows areas are closed year-long to motorized vehicle use. Upper Fish Creek is closed in summer to motorized but open in winter to snowmobiling.

### **Special Features**

The area provides a scenic foreground view for motorists traveling along Colorado Highway 145, which is a portion of the San Juan Skyway, a designated scenic byway and All American Road.

Scenic Features: Foreground to San Miguel range views from San Juan Skyway, Lizard Head monolith.

## Manageability

Limiting parking along the roads would be difficult along the meadows.

Size: 5,805 acres, proposed 2,632 acres.

Boundaries: The area cannot be linked to other roadless areas. All alternatives considered are adjacent to the Lizard Head wilderness and could be considered for addition to that wilderness.

Conclusions: This area capable as wilderness.

## Availability

*Livestock operations:* Inactive sheep allotments are in the area. Livestock developments include stock ponds, fences, and the stock driveway.

*Timber:* Slate Creek and Meadows portions are outside suitable timber base as in the 1992 LRMP amendment. Upper Fish Creek portion is identified as suitable for commercial timber harvest.

There are 745 acres of suitable timber lands in the Lizard Head adjacent roadless area along Forest Road 611 (per December 2005 Governor's roadless meeting materials).

*Minerals*: The area has low to moderate potential of locatable mineral and moderate potential for geothermal, uranium, oil and gas, and coal.

There are no existing oil and gas leases within the Lizard Head adjacent roadless area (per December 2005 Governor's roadless meeting materials).

Cultural resources: The few cultural resource surveys conducted in the area have identified isolated lithic artifacts and lithic scatters. There is a moderate to high likelihood of cultural resources occurring in meadows and along drainages. In densely forested areas and on steep slopes, the probability of cultural resource finds is low. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act. There is aspen art along the Groundhog Stock Drive.

Authorized and potential land uses: There could be use adjacent to these areas along the existing ROW corridor.

Management considerations: The addition of this area to the Lizard Head wilderness would help the overall management on the south and east side of the wilderness by bringing the boundary down to known geographical features and removing a cherry stem route that has been rehabilitated. There are no significant water or wildlife issues associated with this IRA.

### Availability Questions:

- Is the area vitally needed for increased water protection and storage? None known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? *Moderate* potential
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*

• Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known* 

Conclusions: This area is available for wilderness designation.

#### Need

Nearby wilderness: The area is adjacent to the existing Lizard Head wilderness.

*Limited representation covers types*: None known. The cover types represented in the Lizard Head Adjacent roadless area are presented in Table C.12 below.

Table C.12: Lizard Head Adjacent Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
	Acres	1,451	322	0	140	3,087	0	5,000
	%	29.0%	6.4%	0.0%	2.8%	61.7%	0.0%	100.0%
Recommended	Acres	546	71	0	127	1,887	0	2,632
for Wilderness	%	20.7%	2.7%	0.0%	4.8%	71.7%	0.0%	100.0%

Wildlife needs: None known

Conclusions: The area is available for, and capable of, wilderness designation.

The addition of 2,632 acres along the south and west side of the Lizard Head wilderness and the reclaimed road near Cross Mountain Trail 637 would help the manageability of Lizard Head wilderness.

The remaining 2,368 acres along the south and east side of the Lizard Head wilderness would not help wilderness manageability because of the open meadows, an underground telephone line and proximity to Colorado Highway 145.

# PIEDRA AREA ADJACENT (SJ 006) (RARE II 2292) (CRA 292)

### Overview

Acres: 40,841

District: Pagosa/Columbine

History: The RARE II process found that 39,650 acres were suitable for wilderness and the remaining 83,670 acres lacked wilderness character. The Colorado Wilderness Act of 1980 added approximately 1,360 acres of the roadless area in the Pine River valley to the existing Weminuche wilderness. The 1980 Wilderness Act also established the 41,500-acre Piedra Area, which will be managed to maintain those values that make it eligible to be added to the wilderness system until Congress has the opportunity make a decision on the area. The remaining 71,400 acres were allocated to a variety of recreation and commodity emphasis management prescriptions (e.g., to semi-primitive non-motorized recreation, wood fiber production, wildlife, and grazing management). These areas contained non-conforming uses including unimproved roads, water development activity, past timber sales (on perimeter), some gas exploration, buildings, and range improvements throughout. Of the 71,400 acres released, as of 1993, the Piedra Area was created for non-wilderness management, approximately 11,800 had been modified through resource management activities, and 60,000 acres (94 square miles) were roadless.

Location and vicinity: The Piedra Area is in two districts, Columbine and Pagosa.

Access: The area is bounded by 16 Forest Roads and a number of roads located in the large block of private land known as the Piedra Valley Ranch. The roadless area boundaries were inadvertently drawn during the RARE II to include one road, Trail Ridge FDR 639, within the area. The number of NFS trails that access and serve the area are too numerous to list.

*Physical description:* The east side of the area is characterized by south-facing slopes that are deeply dissected by the Piedra River and associated drainages. A few isolated plateau-like areas are scattered throughout. The Piedra River is the dominant drainage feature of the area while the Pine River and East Creek share the far western side of the roadless area.

The elevation ranges from 6,800 feet along the Piedra River to over 12,000 feet near Granite Peak.

*Vegetation:* Vegetation on the area varies with elevation. Coniferous vegetation occurs over 70% of the area. Aspen stands cover approximately 25% of the area. The conifers include Douglas-fir, spruce, white fir, and ponderosa pine. These forest stands are interspersed with grasses, rock, or riparian vegetation. Browse species such as oak and serviceberry are represented in only a few scattered areas, mostly at lower elevations. Old growth ponderosa pine can be found in the area.

Soils: Except for the slopes of Granite Peak and the First Box Canyon, the geology of the area consists of a sequence of sedimentary rock layers overlying the pre-Cambrian basement of granite and quartzite.

Wildlife: The variety in understory vegetation provides very good wildlife habitat, which includes suitable habitat for two USFS sensitive species, peregrine falcon and northern goshawk. The area contains river otter, a state-listed endangered species. The Piedra Area and Piedra Area Adjacent IRA comprise an important elk and mule deer migration corridor between winter range found in the lower elevations within and outside of the planning area and summer range in the Weminuche Wilderness and in the headwaters of the Piedra River tributaries. A CPW survey identified the Piedra's western forests as some of the best available habitat for lynx based on snowshoe hare populations.

Most of the larger streams in this roadless area provide fishing opportunities. Some of the major streams for fishing are East Creek, Mosca Creek, Coldwater Creek, First Fork, Sand Creek, Weminuche Creek, and the Piedra River. Creeks with marginal fisheries include West Prong, Red Creek, Clear Creek, and Trout Creek. Fisheries habitat improvement projects have occurred on East Creek and the Piedra River.

*Current uses:* A full spectrum of recreational opportunities and activities is available and enjoyed by many users. Motorized recreation is available in the form of ATV trails in the southwest adjacent to the Forest Lake area. Also a small fuels project is proposed around the Forest Lake area.

*Surroundings:* The area borders on other NFS lands and private holdings. It shares a common boundary with the Weminuche wilderness between the Pine River valley and Granite Peak on its northwest end.

The NFS lands surrounding this roadless area are managed for a wide variety of recreational and commodity uses. Originally the Piedra roadless area had a logical tie with the Weminuche wilderness through the common boundary between Grassy Point and Granite Peak. However, this tie is somewhat diminished because the West Prong timber sale is now located between the wilderness and the main body of the roadless area. The Piedra roadless area also shares a common point near Granite Peak with the Graham Park area 291.

Key attractions: Coldwater Creek, Devils Hole, and Devil Mountain Trail.

# Capability

### **Environment**

Opportunity for solitude: Moderate potential due to lack of motorized routes.

Naturalness: There have been some prescribed burns for wildlife habitat improvement in the area but they do not materially affect the roadless character. The wilderness character of the 41,500-acre Piedra Area has been maintained. Approximately 54,000 acres of the area not already designated for wilderness study remains roadless. A line cabin for livestock permittees is located along the First Fork in the western roadless addition, along with several livestock fences and an improved pond. There are no significant human imprints other than evidence of hunting camps and similar recreational activities in the roadless additions around Devil Creek and the upper Piedra.

Challenge: Remote setting and complex terrain requires wilderness skill and navigational skill.

Outdoor recreation opportunities: The upper end of the First Fork Trail beginning at Beaver Meadows is included within one large adjacent roadless addition to the west. This trail is popular with backcountry horsemen and during hunting season. The East and West Devil Creek trails in the southeast addition are rugged and relatively unused. The upper Piedra River Trail is popular with anglers downstream of the Piedra picnic ground in the eastern roadless addition.

Special Features

Education: None known

Scenic features: None known

## Manageability

Size: 40,841

Boundaries: Same as described in the overview.

Conclusions: This area is capable as wilderness.

## Availability

Recreation: The Piedra River Trail within the Piedra Area is closed year-long to mechanized recreation (mountain bikes). In the southeast, the East and West Devil Creek trails were closed to motorized use in a 1998 LRMP amendment. Only the Devil Mountain Trail receives regular motorized use at this time. The Heflin Creek and upper Indian Creek addition (Columbine) to the southwest is closed to motorized recreation use by special closure in the travel management plan. The upper First Fork drainage (Columbine) is closed to summer motorized use but winter snowmobile use is allowed. This use occurs primarily along the West Prong timber road and in the adjacent Beaver Meadows, both of which are largely excluded from the roadless area. Approximately half the Bear Creek unit is closed to all motorized vehicles and the remainder contains no trails suitable for motorized vehicles.

*Wildlife:* Available habitat for lynx, peregrine falcon, and northern goshawk is present. The area contains river otter. The IRA is an important elk migration corridor from winter to summer range.

Water availability and use: Stock ponds are the only uses in the IRA.

*Livestock operations:* The current level of livestock grazing is expected to continue with only the ranching economy causing any major changes. Existing range improvements will be maintained.

*Timber:* In the areas where timber harvest has occurred there are opportunities for additional wildlife habitat improvement projects. Some fisheries habitat improvement projects are planned for East Creek but these will be hand constructed and will not modify the roadless character. Old fisheries habitat surveys recommend placing log structures near the mouths of Mosca and Coldwater Creeks.

The Piedra Area contains 17,755 acres of suitable timber lands (update per December 2005 Governor's roadless meeting materials).

*Minerals:* The potential for significant development of locatable and leasable minerals in the area is relatively low. This is evidenced in part by the historic low level of exploration activity. Several lease tracts have been applied for but no leases have been issued and no geophysical exploration activity has been proposed. The areas lie north of the Fruitland outcrop, which is generally considered the northern extent of prospective coalbed methane deposits. At the lowest end of the adjacent area there is low potential for conventional gas.

There are currently no existing oil or gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: No extensive cultural resource surveys have been undertaken in the WSA. One significant aboriginal camp has been identified. Other camps may be discovered in the area, although it is unlikely that finds will be numerous or that any structural ruins exist. No important historic priorities are known to exist either within or in the vicinity of the study area. In the portion of the roadless area not included in the WSA, previous inventories have recorded numerous cultural resource properties consisting primarily of isolated artifacts, lithic scatters, and some mixed artifacts. Historic properties include Ute Scarred Trees, aspen art, historic stock driveways, and logging sites.

The roadless area is situated in the historic territory of the Ute nations, but archival research and contacts with members of the Southern and Ute Mountain Ute tribes have failed to identify any specific sites important to the Ute peoples.

Authorized and potential land uses: There are no planned recreation developments for the area. The area will continue to be managed for the various dispersed recreation opportunities. The trail system will be upgraded and rehabilitated as funds and priorities dictate. The released area outside the WSA could have unplanned road development because of mineral development and oil, gas, and coal leasing.

Management considerations: None known

#### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? No
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Not known

Conclusions: This area is available for wilderness designation.

### Need

Nearby wilderness: Weminuche

Limited representation cover types: Old growth ponderosa pine. The old growth ponderosa pine stands in the Devil Creek drainages and along the upper Piedra River comprise much of the last 5% of remaining old growth ponderosa stands in the San Juan Mountains. Most of the ponderosa pine old growth is already included within the existing congressionally designated area. However, additional significant stands of old growth ponderosa pine occur along the Piedra River immediately upstream of the protected area and in the southeast portion of the Piedra Area roadless area. Such a large expanse of undisturbed, lower-elevation forest is rare in Rocky Mountains. The cover types represented in the Piedra Area Adjacent roadless area are presented in Table C.13 below.

Table C.13: Piedra Area Adjacent Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	978	797	0	1,344	41,654	17	44,789
%	2.2%	1.8%	0.0%	3.0%	93.0%	0.0%	100.0%

Wildlife needs: Elk summer to winter range corridor and habitat for lynx, peregrine falcon, and northern goshawk.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

## RUNLETT PARK (SJ012) (RARE II 2293) (CRA 293)

### Overview

Acres: 5,615

District: Columbine

History: RARE II recommended the addition of approximately 1,200 acres of the area to the Weminuche wilderness. The 1,200 acres were added to the Weminuche wilderness by the Colorado Wilderness Act of 1980. The remaining 5,410 acres were released because they had low wilderness attributes ratings due to the visual impacts of the developments around Vallecito Reservoir. The 1983 LRMP allocated 45% of the area to the grazing management emphasis, 20% to semi-primitive non-motorized recreation, and the remaining to wood fiber production. The bottom (southern) third of the area was burned in the Missionary Ridge fire of 2002.

Location and vicinity: Runlett Park's northeast boundary abuts the Weminuche wilderness while the rest of the irregularly shaped boundary is adjacent to other NFS lands and private lands in the lower Pine River drainage below the wilderness. The area is surrounded on two sides by the Pine River Road 602 and on the third non-wilderness side by Middle Mountain Road 724.

Access: NFS Trail Runlett Park 530.1 serves the area.

*Physical description:* A ridge from the summit of Runlett Peak descends to the confluence of the Pine River with Vallecito Reservoir. The ridge has very little dissection by stream channels and appears to be uniform in geological origin.

The elevation is between 8,000 feet near the Pine River's entry into Vallecito Reservoir and 11,288 feet at the summit of Runlett Peak.

*Vegetation:* The overstory vegetation in the area consists of ponderosa pine at the lower end and spruce and fir on the higher elevations of Runlett Peak. The mid elevations are forested by the mixed conifer type that is prevalent on the SJNF in the mid elevations.

Soils: The soils are varied but all are subject to erosion. Along the west side of Middle Mountain are deep slumple soils.

Wildlife: Lynx are the known threatened species in the area.

Current uses: The primary recreation use is hunting and hiking. The area does serve as a scenic backdrop for the scenery around Vallecito Reservoir. Much of the area can be seen from the reservoir surface. Outfitters use the area for day rides and big-game hunting. The area is open to ATV use but the topography limits use to old fire lines and existing trails.

Surroundings: The non-wilderness NFS lands around most of the area are managed primarily for their recreational values because of their juxtaposition with the recreation uses of Vallecito Reservoir and the ranching and recreational retreat uses of the private lands in the area.

Key attractions: None.

## Capability

### Environment

Opportunity for solitude: There is low to moderate potential for solitude due to the large amount of motorized off-trail use in the area.

*Naturalness:* This area has been impacted by many recent management activities such as travel management prescriptions and fire suppression activities.

Challenge: None known.

Outdoor recreation opportunities: See Overview.

**Special Features** 

Education: None known

Scenic features: See Overview.

## Manageability

Size: 5,615

Boundaries: The area is adjacent to the Weminuche wilderness.

Conclusions: This area is capable as wilderness.

## Availability

Recreation: See Overview.

Wildlife: See Overview.

Water availability and use: None known

Livestock operations: This area contains active allotments with small facilities such as stock ponds and fences.

*Timber:* There are 2,267 acres of suitable timber lands within the area (update per December 2005 Governor's roadless meeting materials).

*Minerals:* Potential mineral activity appears to be minimal even though there was some historic mining activity in the general area.

There are no oil and gas leases in the area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Only two historic sites relating to mining activities are known to occur in the area. Very little survey has been conducted in the area. It is likely that additional sites could occur in open parks and meadows along the drainage. The areas of dense timber and steep slopes have a lower probability of containing cultural resource sites. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no planned recreation developments, wildlife habitat improvement projects, or timber harvest activities. Fuels projects are planned for this area near private lands.

Management considerations: None known.

## **Availability Questions:**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Limited but some potential, no demand
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*

• Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known* 

Conclusions: This area is available for wilderness designation.

#### Need

*Nearby wilderness:* The eastern boundary of the roadless area is adjacent to the Weminuche wilderness.

*Limited representation cover types*: None known. The cover types represented in the Graham Park roadless area are presented in Table C.14 below.

**Table C.14: Runlett Park Area Cover Types** 

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	352	40	0	245	4,980	1	5,618
%	6.3%	0.7%	0.0%	4.4%	88.6%	0.0%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

## RYMAN (SJ015) (RARE 2315) (CRA 315)

### Overview

Acres: 8,665

District: Dolores

History: The RARE II process identified 9,030 acres that were not recommended for wilderness because of numerous unimproved four-wheel-drive routes and range improvements. The 1983 LRMP placed approximately 82% of the area in the semi-primitive non-motorized recreation management prescription and the remaining to semi-primitive motorized recreation and livestock grazing. As of the 1992 LRMP amendment, there had been modification of the character of 1,040 acres through subsequent management practices. The 2006 inventory found the actual roadless area to be 8,665 acres through better GIS mapping procedures.

Location and vicinity: The Ryman area covers steep slopes and canyons on the east side of the Dolores River between Scotch Creek and Roaring Fork. Most of the area is located in Montezuma County with about 600 or 700 acres in Dolores County. Its western boundary parallels the Dolores River, with its north and south boundaries paralleling the Scotch Creek and Roaring Fork roads. The eastern boundary is along the past timber sale areas at the top of the Roaring Fork Road.

Access: The area is generally surrounded by Colorado Highway 145, Scotch Creek, and Roaring Fork Road 435. The Ryman and Salt Creek trails provide access and dissect the area for recreation use.

*Physical description:* Steep slopes climb out of the Dolores River bottom and end in the higher and rolling country between the Dolores River and the Hermosa drainage. The steep slopes that form the Dolores River valley are highly dissected with side drainages that have formed steep-gradient stream bottoms.

The elevation range is between 8,200 feet near the confluence of Roaring Fork and the Dolores River and 10,200 feet near the headwaters of Ryman Creek.

*Vegetation:* Vegetative overstory is the mixed conifer type with ponderosa-aspen mix in the lower elevations and aspen-white fir mix at the upper end. Depending on exposure there are pockets of Douglas fir and spruce.

*Soils:* The parent geology of the area is of sedimentary origin. The soils are varied between shallow and deep but are consistently unstable.

Wildlife: Wildlife species inhabiting the area are typical of wildlife found in the southern Rocky Mountains. There is a good animal species mix because of the varied habitats created by the variety of understory vegetation. Fish improvements have been made on Ryman Creek. There are no known threatened or endangered species in the area. Elk winter in this area.

Current uses: Dispersed recreation in the area is mostly from hunting and occasional hiking or similar day-use activities. Most of the use takes place on the Ryman Trail, snowshoeing, backcountry skiing, and mountain biking. Upper Ryman is open to motorized use (motorcycle). Portions of the area contribute to the scenic enjoyment of visitors driving along the Scotch Creek and Roaring Fork roads. Snowmobiling use is limited and is not an issue in this IRA.

*Surroundings:* NFS lands surrounding the area provide a variety of values. The area in the river bottom and stream bottoms provides a scenic background for recreationists. The area along the eastern side provides for timber harvest and some domestic grazing. The private lands in the river bottom are involved in ranching and home sites.

Key attractions: Ryman Creek.

## Capability

### Environment

Opportunity for solitude: The opportunity for solitude is low in the Dolores River valley due to Colorado Highway 145, and moderate into the east part of the IRA.

*Naturalness:* The area appears natural, with fences and trails as the only known physical intrusions.

Challenge: None known.

Outdoor recreation opportunities: Hiking, hunting, and nature studies.

Wildlife: Typical of Rocky Mountain ecosystems.

Water availability and use: Several perennial streams, including Ryman Creek and Roaring Forks Creek flow from this IRA, which are substantial tributaries to the Dolores River.

#### **Special Features**

Education: None known

Scenic features: None known

# Manageability

Size: 8,665

Boundaries: The area cannot be connected to other roadless or designated wilderness areas.

Conclusions: This area is capable as wilderness.

### Availability

Livestock operations: No active grazing allotments

*Timber:* There are 897 acres of suitable timber lands in the area (per December 2005 Governor's roadless meeting materials). However, there are no timber sales planned in the area.

*Minerals*: There is no potential for locatable minerals or leasable coal. Potential for oil and gas is also low. There are no existing oil and gas leases (per December 2005 Governor's roadless meeting materials).

Cultural resources: Previous cultural resource surveys in the adjacent area resulted in the location of only a few sites. These sites included lithics, lithic scatters, and some isolated artifacts located in meadows. There is a moderate to high likelihood of additional sites being present in meadows, along drainages and near permanent water sources. The likelihood is lower for the steep slopes and dense tree-covered areas. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There has been a watershed project (fish project) in Ryman Creek but its development did not affect the roadless character of the area. There are no other planned developments and projects for any of the SJNF resources. Potential exists for wildlife habitat improvements, but none are planned at this time.

Management considerations: None known

#### Availability Questions:

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? No
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Not known

Conclusions: The area is available for wilderness.

### Need

*Nearby wilderness:* The Lizard Head wilderness is approximately 10 miles north of the Ryman roadless area's northern boundary.

*Limited representation cover types:* None known. The cover types represented in the Ryman roadless area are presented in Table C.15 below.

**Table C.15: Ryman Area Cover Types** 

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	44	128	0	2	8,486	5	8,665
%	0.5%	1.5%	0.0%	0.0%	97.9%	0.1%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including motorized and mechanized travel would be allowed while maintaining the semi-primitive motorized character of the area.

The area's size and shape lend themselves to manageability as wilderness.

## SAN MIGUEL (SJ456) (RARE II 2240) (CRA 240)

### **Overview**

Acres: 64,263

District: Dolores/Columbine

History: The RARE II process identified 60,240 acres of roadless area within the SJNF (the RARE II unit extended 9,630 acres onto the Uncompandere National Forest to the north). The area was not recommended for wilderness because of historic resource (mining) and recreation uses and low public support for wilderness designation. Under the 1983 LRMP, 81% of the area was allocated to semi-primitive non-motorized recreation. The remaining acres were allocated to increased water yield through vegetation manipulation, semi-primitive motorized recreation, roaded recreation in a rural setting, and sawtimber production. The Uncompandere portion was recently studied in the GMUG's 2005 roadless inventory as #56 Hope Lake, 6,811 acres; however, no acres were shown as available or capable for wilderness.

The wilderness attributes rating of RARE II for this area was 20, which placed it in the upper half for the Rocky Mountain region. The fairly high rating is attributed to the wilderness character of the high alpine areas in the north and east part.

Location and vicinity: This area is located in seven townships in San Juan County west of Silverton. Its irregular boundary defines a large area that borders BLM lands west of Silverton and NFS lands along the rugged divide between the SJNF and the Uncompandere National Forest. The western and southern parts of the boundary include lands along the upper Dolores River, Greysill Mountain, Engineer Mountain, and Sultan Mountain.

Access: Points along the following roads are within 0.25 mile of the roadless area: Colorado Highway 145, U.S. Highway 550, Hermosa Park Road 578, Cascade Divide 579, Relay Creek 580, South Mineral 585, Ophir Pass four-wheel-drive 679, Cascade Creek Road 785, and Clear Lake four-wheel drive 815. The area is accessible and served by the following NFS trails: Ice Lake Trail 505, Colorado Trail 507, Engineer Mountain Trail 508, Cascade Trail 510, East Fork Trail 638, Engine Creek Trail 657, Coal Creek Trail 677, and West Lime Trail 679. Parts of several of the trails are now included as a portion of the Colorado Trail.

Physical description: A variety of geological processes formed the high mountain peaks and broad expanses of open rolling alpine tundra areas of the San Miguel roadless area. Glaciers carved deep U-shaped valleys and exposed numerous vertical cliffs.

Elevations range from 8,800 feet near Rico to 13,752 feet at the summit of San Miguel Peak. There are numerous peaks over 12,000 feet and three peaks over 13,000 feet. This area is characterized by many summits above 13,000 feet in elevation with many alpine lakes in between the cliffs. The area's forest is characterized by aspen forests on lower slopes (e.g., around Cascade Creek) and spruce and fir forests on the western side around Sheep Mountain and Lizard Head Pass. However, most of the area is above the tree line. The Lime Creek forest fire in 1879 left stumps and skeletal trees.

*Vegetation:* Vegetation types vary with aspect and elevation. The forested areas are predominantly spruce and fir in the elevations near the tree line and the mixed conifer type in the lower valleys with white fir, Douglas-fir, and aspen. Above the tree line, alpine shrubs and forbs dominate. They are punctuated with rock points, mountain peaks, and rock cliffs

Soils: The area has a great variety of exposed surface geology and numerous soil types that are shallow and deep, eroding, or stable.

Wildlife: Wildlife species found in the area, both above and below the tree line, are those commonly found in the southern Rocky Mountains. The wide variety of vegetation types creates an equally varied habitat

with a variety of animal species. The Canada lynx is the only known threatened species that has habitat in the area.

Current uses: Because of its large size and spectacular scenery, the area provides a wide variety of dispersed recreation. Recreational activities include everything from hiking and backpacking in isolated areas to motor-biking along trails. Most of the area on the Dolores side is in an F area; snowmobiling in Tin Can Basin is popular, along with backcountry skiing, snowshoeing, ATV use, dispersed camping, and Jeeping. Big-game hunting outfitters and guides use the area. On the Columbine there is snowmobiling, Sno-Cat skiing, and heli-skiing. The Colorado Trail has mountain bike use. Municipal watershed structure for Silverton is located in the northeast corner of the area. The Little Molas and South Mineral areas have recreation campgrounds and power lines, and are cherry-stemmed out of the IRA. There are groomed snowmobile routes on the east side by Molas Lake in the IRA.

Surroundings: Multiple uses of the NFS lands surrounding the area include a wide variety of recreational uses from primitive activities to downhill and helicopter skiing. Timber harvest, wildlife habitat management, and domestic livestock grazing are emphasized in different management units outside the roadless area boundaries.

Key attractions: Trails to Engineer Mountain and Ice Lake Basin; 20-mile segment of the Colorado Trail.

### **CAPABILITY**

### Environment

Opportunity for solitude: There is good opportunity for solitude except in those portions of the roadless area that are in close proximity to roads.

*Naturalness:* The area has some historic resource (mining, logging) use, livestock ponds, and recreation uses in the form of trails and mountain bike routes that affect the naturalness of the area.

Challenge: Difficult peaks

Outdoor recreation opportunities: Most of the area is closed to year-round motorized recreation other than snowmobiling. Snowmobile use occurs in the extreme southwest corner of the area near Bolam Pass, the area around Little Molas Lake, and Sno-Cat skiing around Cascade Divide. Mountain bike use occurs on the Colorado Trail and trails feeding into it. The trail up Engineer Mountain is one of the busiest on the Columbine District. Hunting and big-game outfitters use the area.

### **Special Features**

*Education:* The proposed Grizzly Peak RNA is in the northwest portion of roadless area, proposed for its tufted hairgrass, wet spruce-fir forest, and alpine vegetation on large areas of shale geology.

Scenic features: Ice Lake Basin, Engineer Mountain, and Grizzly Peak are just some of the scenic features.

### Manageability

Size: 64,263 acres.

Boundaries: This roadless area has no logical linking with other roadless areas or existing classified wilderness.

Conclusions: This area is capable as wilderness.

### Availability

Recreation: Most of the area is closed to year-round motorized recreation other than snowmobiling. Snowmobile use occurs in the extreme southwest corner of the area near Bolam Pass, the area around Little Molas Lake, and Sno-Cat skiing around Cascade Divide. Mountain bike use occurs on the Colorado

Trail and trails feeding into it. The trail up Engineer Mountain is one of the busiest on the Columbine District. Hunting and big-game outfitters use the area.

Wildlife: The area would provide a corridor from Lizard Head to the South San Juan wilderness.

Water availability and use: Bear Creek is a municipal watershed for Silverton.

*Livestock operations:* There is an active sheep livestock allotment within the IRA and there are livestock reservoirs in the area.

*Timber:* Tin Can and East Flattop are in the suitable base for timber. Previous timber sales proposed for the slopes of Sheep Mountain in mature and old growth spruce-fir generated intense public controversy. It is anticipated any future timber sales proposed for the roadless forests within San Miguel would result in similar public controversy. There is no ecological need to manipulate these forests through mechanical means.

There are 2,523 acres of suitable timber lands in the area (per December 2005 Governor's roadless meeting materials).

*Minerals:* There is low to no potential for oil and gas or coal. Overall, the area is highly mineralized and could experience a resurgence of hard rock mining activity. Numerous patented mining claims in high valleys have large portions that are underlain by shale, sandstone, limestone, and other sedimentary strata lacking in potential for hard rock minerals. The northern portions of the unit contain more volcanic rocks. The Mineral Creek drainage was the focus of historic mining activities.

From the Grizzly Peak RNA evaluation (1996): Grizzly Peak occurs in an area of concentrated historic mining activity. There are no active mines or mining claims within the potential RNA boundaries. The Graysill Mine, an abandoned gold works, is located 0.5 mile south of the boundary near Bolam Pass.

There are no existing oil and gas leases within the San Miguel roadless area (per December 2005 Governor's roadless meeting materials).

Cultural resources: From Grizzly Peak RNA evaluation (1996): Three archeological sites and one historic locality are known from Grizzly Peak, including an open camp, two concentrations of stone tool flakes, and an abandoned piece of mining machinery. Cultural resource inventories in the area have identified a number of artifact sites. Most prehistoric sites are lithic scatters and the historic sites are Ute Scarred Trees, historic mining features, and segments of the Rio Grande Southern Railroad. Many of these cultural resource properties may be eligible for the National Register of Historic Places. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no other USFS recreation developments or wildlife habitat improvement projects planned within this area. The area immediately north of Purgatory ski area has been inventoried as an expansion area for the ski area. There is some potential for cabins being built on patented mines. Unplanned impacts to the area could also result from access roads and utility corridors if the private lands within the area were to be developed.

A Jeep road accessing a 320-acre private inholding near Sheep Mountain is only used by the landowner and is a minor influence on the larger landscape. Another abandoned Jeep trail leading into headwaters of South Mineral Creek, a hiking trail to Hope Lake overlook, also has a minor impact to the area

Management considerations: The Grizzly Peak proposed RNA is located 9 air miles northeast of Rico on the Dolores Ranger District of the SJNF. It includes 5,672 acres of spruce-fir forest, subalpine and alpine wetlands, and alpine turf cover types typical of the high-precipitation zones in the San Juan Mountains. State lands, private inholdings, and cherry-stem roads into the general area would complicate management of this area as wilderness.

### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? *The northern portion is mineralized.*
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? The area has potential but there is currently no demand.
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available for wilderness designation.

### Need

*Nearby wilderness:* The San Miguel roadless area is about a mile from the existing Lizard Head wilderness, separated by Colorado Highway 145. The area is about a mile from the Weminuche wilderness to the east, separated by U.S. Highway 550.

*Limited representation cover types*: None known. The cover types represented in the San Miguel roadless area are presented in Table C.16 below.

Table C.16: San Miguel Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	18,664	1,681	2,823	11,796	29,099	99	64,162
%	29.1%	2.6%	4.4%	18.4%	45.4%	0.2%	100.0%

*Wildlife needs*: Lynx and pine marten use this area as a linkage landscape between the Lizard Head and Weminuche wilderness areas

Conclusions: The San Miguel IRA is a large roadless area that would not add significantly to the National Wilderness Preservation System. The IRA offers extraordinary opportunities for backcountry treks along the Colorado Trail and mountain climbing on Engineer Mountain, provides a backyard-style primitive experience for local residents as an alternative to the nearby wilderness areas such as the Weminuche. There are currently opportunities for mountain biking, horse use, and hiking within this IRA. The San Miguel roadless area provides a wildlife corridor between the two wildernesses along the San Juan Mountains' western perimeter. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

Private inholdings, state lands, and roads forming "cherry stems" into the area potentially complicate management of this area as wilderness.

# SOUTH SAN JUAN ADJACENT (SJ002) (RARE II 2284) (CRA 284)

### Overview

Acres: 34,898

District: Pagosa

History: The RARE II process identified 123,320 acres of roadless area. In total, 44,890 acres were recommended for wilderness and the Colorado Wilderness Act of 1980 added 39,843 acres of the roadless area to the South San Juan wilderness. An additional 32,800 acres were designated as the San Juan wilderness expansion study area. This study area is actually composed of two separate areas, one adjoining the north (Montezuma Peak) and one adjoining the southwest side of the wilderness (V-Rock).

Subsequent study for wilderness expansion area concluded that both of the areas were not suited for wilderness since they include ecosystems and landforms found in abundance in the Weminuche, the South San Juan, and other nearby wilderness. The probability of a significant mineral discovery and probably oil and gas exploration activities was also fairly high in the expansion areas. The remaining 7,620 acres were not suited for wilderness because of oil and gas potential and numerous non-conforming uses. In the 1983 LRMP, the V-Rock area was allocated to semi-primitive non-motorized recreation, wildlife, livestock grazing, and timber management. The major allocation of the Montezuma area was to semi-primitive non-motorized recreation, the proposed East Fork ski area, and nominal amounts of semi-primitive motorized recreation, big-game winter range, sawtimber production, and timber management.

Location and vicinity: This large roadless area, 123,320 acres, covers essentially all of the eastern side of the Pagosa District from the Elwood and East Fork drainages southward to the Navajo River. The major part is located in Archuleta County with smaller portions in Mineral, Rio Grande, and Conejos Counties. The area borders the Continental Divide and Rio Grande National Forest on the north and east, the large Banded Peaks Ranch on the south, and mixed NFS lands and private lands on the west.

Access: The area is 0.25 mile or closer to 13 Forest Roads and U.S. Highway 160. Big Branch Road (664) extends into the interior of the roadless area approximately 1.5 miles. The area is accessible and served by a large NFS trail system. Nearly every drainage has a trail leading from a road into the area and then connecting with other trails in the area. The large number of trails is the result of historic livestock use in the area.

Physical description: The physical characteristics of this roadless area vary from open rolling terrain to the spectacular vertical cliffs and peaks of the rugged mountains along the Continental Divide. The area's water courses include numerous streams and rivers, all of which are tributaries of the San Juan or Navajo Rivers. The highly dissected valleys contain a large variety of surface geology and soil types.

The elevation ranges from 7,600 feet on the Blanco River to 13,300 feet at Summit Peak.

Vegetation: The wide range of elevation, slope, aspect, and soil types has resulted in an extremely complex mixture of vegetation communities. However, the southern portion of the roadless area contains one of Colorado's largest and oldest stands of aspen trees, making it an outstanding fall color viewing area on the SJNF. Pine and oak are the dominant vegetation types at the lower elevations. As elevation increases, a transition to mixed conifer occurs and then on to a fir-aspen complex. Douglas-fir is found on the northern aspects throughout the mixed conifer type. The higher elevations near the tree line have spruce-fir forests with the alpine tundra above. Interspersed throughout the forested areas are open grassland parks and occasional wet meadows.

Soils: The area has a great variety of exposed surface geology and numerous soil types that are shallow to moderately deep and mostly erodable.

Wildlife: This area contains numerous wildlife species native to the southern Rocky Mountains. Some of the unique and interesting species are the white-tailed ptarmigan and bighorn sheep. Economic game animals such as deer, elk, and bear are abundant. The wide variety of understory vegetation in the mixed conifer forest type coupled with the many different combinations of overstory tree species results in high-quality habitat for many animal species.

There is suitable habitat for Canada lynx, a federal threatened species.

Fisheries include the headwaters of Blanco River, Quartz Creek, Castle Creek, and Sand Creek.

*Current uses:* Primary recreation use includes hunting, hiking, hobby gold-panning, and scenic viewing. The fall color season enhances the scenic vistas of this roadless area even though the recreationists are driving on boundary roads.

Since the 1979 RARE II, management activities that changed the roadless character of a small portion of area are the Benson Creek timber sale and the proposed East Fork ski area. The sale impacted 1,120 acres. An additional 840 acres for the access road and outer cutting blocks was also affected by 7.5 miles of new road construction.

Surroundings: NFS lands surrounding this area are managed for a wide variety of recreational and commodity uses. This area is adjacent to the South San Juan wilderness. This area is separated from the Treasure Mountain roadless area by the Elwood Pass Road. The road is an important four-wheel-drive route and also contains a buried natural gas line.

Key attractions: None known

## Capability

### **Environment**

Opportunity for solitude: Opportunity for solitude ranges from moderate to minimal because of the recreational activities, roads, and campgrounds.

Naturalness: These are smaller areas with few intrusions that affect naturalness.

Challenge: Remote high country setting for alpine scrambling and off-trail travel.

Outdoor recreation opportunities: See current uses.

Special Features

Education: None known

Scenic features: None known

## Manageability

Size: 34,898

Boundaries: This roadless area is adjacent to the South San Juan wilderness.

Conclusions: The area is capable as wilderness.

## Availability

Recreation: See current uses

Wildlife: No known issues

Water availability and use: No known issues

*Livestock operations:* The area contains active grazing allotments and few facilities such as livestock ponds and fences.

*Timber:* There are 2,633 acres of suitable timber lands in the area (per December 2005 Governor's roadless meeting materials).

*Minerals:* The potential for a significant mineral discovery is high. Oil and gas exploration activities can be considered probable. Low potential for coal development exists in the southwestern one-third of the area. Fifteen oil and gas leases exist in the area and drilling activities are expected in this decade. The majority of the mineralized areas are located in the portion of the roadless area that was not designated for wilderness or allocated to the ski area.

There is a high probability of gas and oil development in the southern half of the area, which would result in the construction of roads, pipelines, and other facilities supporting oil field development.

There are 15 acres of existing oil and gas leases within the South San Juan Adjacent roadless area (per December 2005 Governor's roadless meeting materials).

Cultural resources: Previous cultural resource surveys in this roadless area have identified numerous sites and properties. Prehistoric finds include everything from isolated artifacts to lithic groups. Historic resources and features relate to mining and ranching activities and historic "Aspen Art" groves. Predicted sensitivity for cultural resource finds is moderate in meadows and along drainages and low to moderate in the dense forested areas. The Ute Mountain Ute Tribe expressed that the East Fork has some historic significance to their peoples but they did not elaborate. There are no other known areas of interest under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no planned NFS developments in the area. The existing trail system will be maintained and rehabilitated as funds become available.

The areas allocated provide semi-primitive non-motorized recreation opportunity while the areas roaded for other resource uses will be managed for semi-primitive motorized and roaded natural recreational opportunities.

Current levels of livestock grazing are expected to remain the same with existing range improvements maintained and/or upgraded as needed.

### **Availability Questions:**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? Yes
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? No

Conclusions: This area is available for wilderness designation.

### Need

*Nearby wilderness:* The RARE II\_analysis indicated that the expansion areas were not needed as an addition to the National Wilderness Preservation System. The expansion areas include ecosystems and landforms found in abundance in the Weminuche, the South San Juan, and other nearby wilderness.

*Limited representation cover types*: None known. The cover types represented in the San Juan Adjacent roadless area are presented in Table C.17 below.

Table C.17: South San Juan Adjacent Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	702	351	263	3,858	29,815	88	35,077
%	2.0%	1.0%	0.7%	11.0%	85.0%	0.3%	100.0%

Wildlife needs: None known

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

## STORM PEAK (SJ002) (RARE 2305) (CRA 305)

### Overview

Acres: 57,617

District: Dolores

History: The RARE II process identified 52,720 acres of roadless area, which were not recommended for wilderness due to the many roads constructed into the high country between the Dolores and West Dolores Rivers and the combined effects of developments (e.g., mining, unimproved roads, range improvements). The 1983 LRMP subsequently allocated the area to a wide variety of management prescriptions that emphasize every resource from recreation to intensive wood fiber production. As of the 1992 LRMP amendment, approximately 7,350 of the released acres were modified through resource management practices, and 44,920 acres (70.2 square miles) were managed in a roadless condition.

Location and vicinity: The Storm Peak roadless area is located in Montezuma and Dolores Counties. The area is located in portions of nine townships near the center of the Dolores District. The northwestern boundary roughly parallels the West Dolores River except for setbacks to exclude the Stoner Mesa and Eagle Creek Roads, which forms boundaries for the Storm Peak roadless areas. Where the boundary drops down to the Dolores River near Cayton Campground, it turns and meanders southeast along the Dolores River except for setbacks to exclude the roaded areas around Rico and on Taylor Mesa.

Points along the following roads are within 0.25 mile or less of the roadless area boundary: West Dolores Road 535, Stoner Mesa Road 686, Eagle Creek Road 471, Colorado Highway 145, Taylor Creek Road 545, Pothole 692, Taylor Mesa Road 547, and Priest Gulch Road 548. The following NFS trails access or serve the area: Wildcat Trail 207, Calico National Recreation Trail 208, Johnny Bull Trail 639 and 640, Burnett Trail 641, Priest Gulch 645, Twin Springs Trail 739 (also NFS trails 200, 102, 639, 644, 648, 660), Tenderfoot 633, Stoner Creek 625, Falls Creek (East Fork 208, West Fork 640), Geyser Springs Trail 648, Horse Creek, 626 Eagle Creek Trail 624, Spring Creek Trail 627, Twin Springs 729, Loading Pen 738, Section House 200, and School House 660 Trails, all non-motorized, as well as Stoner Mesa Trail. The west two-thirds of the Stoner Area is currently F (open) area.

Points along the following roads are within 0.25 mile or less of the Stoner Mesa portion of the roadless area: Colorado Highway 145, Taylor Creek Road 545, and Taylor Creek Road 201. The following NFS trails access or serve the area: Lower Stoner Trail, Stoner Mesa Trail 624, Stoner Creek Trail 625, and Stoner Creek Trail 738.

*Access:* The area is accessible via the West Fork Dolores (Dunton Road) from the north and west, and from Forest Road 471(Taylor Mesa) and Forest Road 545 from the south and east.

Physical description: The area includes a variety of topographic features, including mountain peaks, mesas, deep canyons, steep valley slopes, and rolling high country. It is highly dissected by numerous streams that are tributary to the Dolores and West Dolores Rivers. The area is characterized by Stoner Mesa, its sloping sides and the Stoner Creek valley. The area is bounded on the west by the Dolores River and contains various creeks and draws such as Stoner Creek.

The area's elevation ranges from 7,400 feet near the confluence of the two Dolores Rivers up to 12,340 feet at the Elliott Mountain summit in the Stoner Mesa roadless portion.

Vegetation: Vegetation varies according to elevation and exposure. Typically, ponderosa pine and Gambel oak are in the lower country and mixed conifer is found in mid elevations. There are nine or more mountain peaks that have spruce and fir and limited amounts of alpine tundra. In the Stoner Mesa area, aspen forests and ponderosa pine and oak brush are found at lower elevations. Spruce, aspen, and fir are found at higher elevations. Blue spruce occurs occasionally, particularly along streams, and the steep slopes below Stoner Mesa's rim and below the west rim of Taylor Mesa offer pure stands of uncut aspen.

Water availability and use: Fish Creek and Willow Creek are the primary perennial streams within the IRA. Irrigation ditches divert some of the waters originating within the IRA.

*Soils*: Geology of the area is manifested by rock outcrops and cliffs of both sedimentary and igneous origin. The soil types vary widely and run the full range of instability to stable and shallow to deep.

*Wildlife:* Wildlife species found in this area are typical of those found in the southern Rocky Mountains. The large number of vegetative types has created an extremely diverse habitat. There are no known threatened or endangered species in the area.

Current uses: Lower Stoner Trail and Forest Trails 624, 625, and 738 run through the roadless area. Livestock use occurs on the mesa top. Stoner Mesa has many livestock ponds, spring develops and reservoirs, and miles of fences. Motorized routes are visible on Stoner Mesa, near Aspen Reservoir. The Sunshine Road is visible for a long distance. Expectation Peak has a communication tower (passive microwave relay). Two-thirds of the area is available for off-road motorized use (F open area) and a majority of trails are suitable for motorized use.

Surroundings: A wide variety of resource and recreational uses occur on the NFS lands surrounding the Storm Peak area. In the Rico area, there are the visages of the mining activity for which the town was settled. Both the Dolores and the West Dolores rivers were studied for Wild and Scenic Rivers values. The Dolores was found to be eligible for addition to the National Wild and Scenic Rivers System, but Congress has not acted on the issue.

Key attractions: Stoner Mesa and several 11,000- to 12,000-foot peaks, and primitive natural landscapes.

## Capability

#### Environment

Opportunity for solitude: Opportunity for solitude is low to moderate due in part to the numerous motorized trails.

Naturalness: There are six or seven stock reservoirs scattered across Stoner Mesa. Although several of these blend closely into the environment, some are evident even to the casual observer. The others have obviously constructed earthen berms, but these six or seven stock ponds are widely scattered across the mesa and are usually screened by dense aspen forest. There also exist several range fences crossing the mesa from rim to rim, which are also well screened.

Challenge: None known.

Outdoor recreation opportunities: The area has a number of trails that provide for a diverse travel-related recreational opportunity. Hunting, hiking, motorcycles, and horseback riding are probably the predominant activities. The Calico National Recreation Trail follows the ridgeline from the Dolores River to Storm Peak and continues on through spruce forests to Morrison Creek. The area also includes the Priest Gulch Trail and the upper end of the Stoner Mesa Trail. The Calico Trail and Priest Gulch Trail are open to motorized recreation use. The Stoner Mesa Trail runs the length of the mesa and the Eagle Peak Trail parallels Stoner Creek. Recreational activities include hiking, backpacking, horse packing, hunting, and fishing. The area is used for backcountry skiing and the northern portion is used by snowmobiles. Recreation outfitters use the area for big-game hunting and packing services, horseback riding, and fishing.

### **Special Features**

Education: None known

*Scenic features:* The area contains the Calico National Recreation Trail, which was the first national recreation trail designated on the SJNF.

### Manageability:

Size: 57,617. The area is large enough to manage as a standalone wilderness area.

Boundaries: The area has an irregular and meandering boundary. The area cannot be linked to other roadless areas or existing wilderness.

Conclusions: This area is capable as wilderness.

Availability

Recreation: See Capability.

Wildlife: See Capability.

Water availability and use: See Capability.

*Livestock operations:* Presently there are no known impacts from planned recreation and livestock management projects. There is some opportunity for wildlife habitat improvement through vegetative manipulation, but no projects are currently planned for the area.

*Timber:* All previous timber sales were removed in the new inventory.

In total, 5,571 acres are suitable timber lands (per December 2005 Governor's roadless meeting materials).

*Minerals:* The Department of Energy shows that about 60% of the area may contain nuclear mineral resources. The area also contains known geothermal and locatable minerals. There are existing mineral leases. Patented mining claims dot the Horse Creek watershed west of Rico.

Oil and gas potential is low and there no existing oil and gas leases in the roadless area. There is an existing oil lease on Taylor Mesa (per December 2005 Governor's roadless meeting materials).

Cultural resources: The many cultural resource surveys in or about the area have located and identified numerous sites consisting of isolated lithics, lithic scatters, some ground stones, historic aspen art, and habitation structures. Many of these sites are likely to be eligible to be listed in the National Register of Historic Places. There is a moderate to high likelihood of additional sites occurring in open parks and meadows, along drainages, and on level areas near permanent water sources. The likelihood of sites occurring on steep slopes and in dense timber is low to moderate. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: Access to approximately 17 private land holdings could impact roadless characterizes.

Management considerations: The Calico Trail and Priest Gulch Trail are open to motorized recreation use. There are numerous motorized trails in the area and two-thirds of the area is open to motorized use. Stoner Mesa receives extensive ATV use on decommissioned and/or closed NFS roads.

## **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? There is potential for mineral leasing and oil and gas development.
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: The area is available as wilderness.

### Need

*Nearby wilderness:* The Lizard Head wilderness is approximately a mile from the Storm Peak's northern boundary.

Limited representation cover types: Some old growth spruce-fir in the Dolores River drainage occurs in Storm Peak, including the old growth stands of Truby Creek. The Truby Creek old growth spruce forest is uncommon on the SJNF because it is located on gentle slopes. The cover types represented in the Storm Peak roadless area are presented in Table C.18 below.

**Table C.18: Storm Peak Area Cover Types** 

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	3,870	664	0	3,017	50,043	29	57,623
%	6.7%	1.2%	0.0%	5.2%	86.8%	0.1%	100.0%

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including motorized and mechanized travel would be allowed while maintaining the semi-primitive motorized character of the area.

Manageability as a single wilderness unit would be difficult due to the area's convoluted shape, extensive boundary length, and extensive adjacent road network (which includes both open and closed roads).

## TREASURE MOUNTAIN (SJ003) (RARE II 2285) (CRA 285)

## Overview

Acres: 22,500

District: Pagosa

History: The RARE II process identified 21,910 acres of roadless area that were not recommended for wilderness because of mineral potential and the lack of solitude. Subsequent land use designations made by the 1983 LRMP were 2,310 acres to the potential Wolf Creek Valley ski area (Windy Pass) and the remaining 19,540 acres to semi-primitive non-motorized recreational opportunities. As of the 1992 LRMP amendment, of the original 21,910 acres in this roadless area released for non-wilderness management activities, 720 acres had been modified through resource management activities. At the conclusion of the 1992 planning period approximately 21,190 acres were to remain in roadless character.

Location and vicinity: This roadless area is located in portions of seven townships, lying east of U.S. Highway 160, between the East Fork drainage and Wolf Creek. Its southern boundary parallels the East Fork Road from the West Fork Valley up along Elwood Creek to the Continental Divide near Elwood Pass. The eastern leg of the northern boundary follows along the Continental Divide between Elwood and Treasure Pass. The northern boundary drops down along the timber sale areas along the highway on the west side of Wolf Creek Pass.

Access: Points along the following roads are within 0.25 mile of the roadless area: U.S> Highway 160, East Fork 667, Falls Creek 039, and Wolf Creek Road 725. The area can also be reached along the Continental Divide from the Rio Grande National Forest side via Park Creek, Tucker Park, and Elwood Pass roads. The area is accessible and served by the following NFS trails: Treasure Mountain Trail 565, Windy Pass Trail 566, and Silver Creek Trail 567. The Continental Divide National Scenic Trail skirts the area along the east side of the area.

Physical description: A prominent ridge descends westward from the Continental Divide with a few high points that are not individual mountains. The area is dissected by seven named tributaries to the forks of the San Juan River, creating an undulating southern exposure of the East Fork. The northern exposure of the Wolf Creek drainage is much steeper with little diversity in its geomorphological form.

Elevation ranges from 8,400 near the confluence of the east and west forks of the San Juan River to 12,000 feet along the Continental Divide.

*Vegetation:* Vegetation varies with elevation and exposure. On the higher slopes of the southern exposures the dominant cover is spruce and fir. On the mid to lower slopes the mixed conifer type, with aspen, is the predominant cover. The slopes of the northern exposure are nearly all covered with spruce-fir that is punctuated with an occasional cliff or rock outcrop. Near the higher elevations in the Elwood Pass area there are a number of open grassy parks.

Soils: The area has a great variety of exposed surface geology and numerous soil types that are shallow to moderately deep and mostly erodable.

Wildlife: Wildlife species inhabiting the area are typical of the southern Rocky Mountains. Black bear, elk, and yellow-bellied marmot are abundant. A very diverse wildlife habitat created by the mixed conifer forest type results in an equally diverse number of wildlife species. The area contains an active eyrie of peregrine falcon on its west side. There is suitable habitat for Canada lynx. This is where evidence of historic Canada lynx in the SJNF comes from. This area is a migration corridor from east to west. This area is part of the Canada lynx linkage area between the South San Juan and Weminuche wilderness areas.

There are some fishing opportunities in the area: Wolf Creek, East Fork of the San Juan River, Silver Creek, and Falls Creek.

Current uses: The area is managed for semi-primitive non-motorized recreational opportunities. Dispersed activities are mostly land-based because the streams do not provide any measurable fishing. Most use, other than big-game hunting, occurs as day-use activities from points along the roadless area border. During the winter months the area around Treasure Mountain is heavily used by snowmobile riders from the top of Wolf Creek Pass and the old Wolf Creek timber access roads. There are two motorized trails, the Windy Pass Trail (primarily motorcycles) and Treasure Mountain Trail (primarily motorcycles), that are open to motorized use.

Surroundings: The use of NFS lands surrounding the roadless area is mostly recreational/tourism-oriented. The area is adjacent to the Wolf Creek ski area, the proposed East Fork ski areas, Elwood Pass four-wheel-drive route, and the Wolf Creek Pass highway corridor. These adjoining areas are managed for their recreation and scenic attributes.

Key attractions: Continental Divide

## Capability

### Environment

Opportunity for solitude: Most of the area can be seen from and affected by the activities along Wolf Creek Pass and the existing and potential ski area. The opportunity for solitude is low to moderate. During the winter months the area around Treasure Mountain is heavily used by snowmobile riders from East Fork Road to Elwood Pass. Elwood Pass is used by snowmobiles and hybrid skiers. Elwood Pass has been one of the entrance points for trespass by snowmobilers into the South San Juan wilderness.

*Naturalness:* The area is primarily natural in appearance, but is adjacent to the developed Wolf Creek ski area and U.S. Highway 160 is visible and audible from portions of the unit. See also previous section for a description of the area's natural features.

Challenge: None known.

Outdoor recreation opportunities: See Current uses.

<u>Special Features</u> <u>Education:</u> None known Scenic features: Continental Divide

## Manageability

Size: 22,500

Boundaries: The area cannot be connected to other roadless areas or existing wilderness because it is completely surrounded by highways or roads.

Conclusions: The area is capable as wilderness.

## Availability

Recreation: See Current uses.

Wildlife: The area hosts an active peregrine falcon eyrie along the cliffs and rock outcrops of the western

Water availability and use: No known issues

*Livestock operations:* The area contains active grazing allotments and few facilities such as livestock ponds and fences.

*Timber:* One timber sale, in 1984, affected the area since the RARE II analysis. The Falls Creek timber sale modified the roadless character of approximately 80 acres. No permanent roads were constructed for this sale. In addition, the roadless area boundary was originally drawn around a portion of the old Falls Creek timber sale areas, which actually have about 640 acres that included old logging roads and clearcut areas prior to the RARE II designation.

In total, 55 acres suitable for timber production (per December 2005 Governor's roadless meeting materials)

*Minerals*: There are no existing oil and gas leases within the Treasure Mountain roadless area (per December 2005 Governor's roadless meeting materials). The potential for oil and gas is high to moderate. There is high potential for hard rock mining in the Elwood Pass area southwest of Summitville.

Cultural resources: Previous cultural resource inventories have resulted in some small limited lithic finds. The area is more known for its historic lore of the "Lost Treasure" for which the area was named. Based on the SJNF cultural resources model and data from surveys in surrounding areas, there is a good chance of additional lithic finds occurring in open parks/meadows and along drainages. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no planned recreation, wildlife, or timber/harvest projects in this area that would change the roadless character. Potential for the development of hard rock minerals and oil and gas exist in the area; thus road construction is possible.

Treasure Mountain includes the site of the one-time proposed Wolf Creek Valley ski area, approximately 2,370 acres on the area's western boundary. There is currently no formal proposal for Wolf Creek Valley.

*Management considerations:* Adjacent to existing ski area, backcountry ski use, adjacent to U.S. Highway 160, private property, and development along south boundary.

## Availability Questions

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No

- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? Yes
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? Not known

Conclusions: The area is available for wilderness designation.

### Need

*Nearby wilderness:* The Treasure Mountain roadless area is less than a mile from the Weminuche wilderness to the northwest, separated by U.S. Highway 160, and separated from the South San Juan wilderness on the southeastern tip by Forest Road 667. Treasure Mountain provides a high-elevation link between the South San Juan wilderness and the Weminuche wilderness.

*Limited representation cover types*: None. The cover types represented in the Treasure Mountain roadless area are presented in Table C.19 below.

Table C.19: Treasure Mountain Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	1,211	543	219	754	19,780	5	22,512
%	5.4%	2.4%	1.0%	3.3%	87.9%	0.0%	100.0%

*Wildlife needs*: A lynx track was identified in the East Fork in the early 1990s. This is near the last confirmed grizzly bear sighting in the Southern Rocky Mountains.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

# TURKEY CREEK (SJ004) (RARE II 2286) (CRA 286)

### Overview

Acres: 25.300

District: Pagosa

History: The RARE II process identified 23,260 acres of roadless area that were not recommended for wilderness because of mineral potential, lack of solitude, and the amount of livestock grazing. Subsequent land use designations by the 1983 LRMP were 14,180 acres to semi-primitive non-motorized recreation, 6,640 acres to a livestock use, and 2,600 acres to wood fiber production. As of the 1992 LRMP amendment, of the original 23,260 acres released for non-wilderness management activities in this roadless area, 260 acres had been modified through management activities and 22,350 acres were to remain unroaded at the conclusion of the 1992 planning process. Because of similarities, this write-up combines Turkey Creek RARE II with Sheep Mountain (RARE II 2307).

Location and vicinity: Turkey Creek is located in Mineral and Archuleta Counties near the center of the Pagosa District.

Access: Roads adjacent to the area include the West Fork Road (648), Fourmile Road 645, Snowball Road 646, Jackson Mountain Road 037, Laughlin Creek Road 738, and U.S. Highway 160. Forest Trail 580 accesses the area up Turkey Creek and is the only trail bisecting the roadless area and going on into the Weminuche wilderness.

*Physical description:* A highly dissected slope descends from the higher peaks along the Weminuche wilderness boundary. Turkey Creek and Quien Sabe Creek are the two main drainages and are tributaries of the San Juan River.

The elevation ranges from 7,600 feet near the mouth of Turkey Creek to 12,137 feet at the summit of Eagle Peak No.2. Another prominent mountain peak and well-known landmark in the Pagosa Springs area is Saddle Mountain at 12,033 elevation.

*Vegetation:* There is a full range of forest cover types represented, starting with ponderosa pine in the lower elevations, changing to spruce and fir at the higher elevations. There is some alpine tundra near the summits of Saddle and Eagle Peaks. Since the area is generally a southern exposure there is a minimum of tree species that are usually found at comparable elevations on northern exposures.

Soils: The geology of the area is a variety of Quaternary period deposits and is fairly unstable. The area is marked by many prehistoric slumps and slides. The soils are primarily shales, varying in depth, and considered fairly susceptible to erosion as evidenced by the amount of slips, slides, and gullies.

Wildlife: Animals that inhabit this area are typical of the southern Rocky Mountains. Wild turkey and bighorn sheep are present because the overall southern exposure provides excellent habitat. The numerous understory vegetation types with numerous understory plant species provide a large diversity of animal habitats, making the area very rich in all the common fauna species. The area does contain suitable habitat for Canada lynx. This area is part of the Canada lynx linkage area between the South San Juan and Weminuche wilderness areas.

*Current uses:* Recreational use of the area is mostly hiking, horseback riding, and hunting. Fishing opportunities exist in Turkey Creek. A motorized trail runs about 3 miles up Turkey Creek from the trailhead.

Surroundings: The area is surrounded by the Weminuche wilderness on its northern boundary, private lands along its eastern boundary, and a mix of private and NFS lands on the south and west boundaries. The use of NFS lands surrounding the roadless area has been varied. Aside from the adjacent wilderness lands other resource activities include timber sales and livestock range improvements in the Four Mile and Snowball drainages. Activities along the eastern boundary on the private lands are ranching and subdivisions. There is also a USFS summer home group along the boundary. Adjacent private ranch lands are protected in part by private conservation easements.

Key attractions: Turkey Creek

## Capability

### **Environment**

Opportunity for solitude: Opportunities for solitude vary from low to high depending on location in this large roadless area. Solitude is low along the highway and Wolf Creek Pass, becoming high as one nears the wilderness boundary.

Naturalness: This area has not been modified by any resource management activities.

Challenge: None known.

Outdoor recreation opportunities: The area is closed to motorized use except for snowmobiling on ungroomed routes.

Special Features

Education: None known

Scenic features: Turkey Creek

## Manageability

Size: 25,300

Boundaries: Same as described in the overview.

Conclusions: This area is capable as wilderness.

## **Availability**

Recreation: See Overview.

Wildlife: See Overview.

Water availability and use: None known

*Livestock operations:* There are a number of fences erected for the control of livestock. The area also contains a number of livestock watering ponds.

*Timber:* There are currently 3,914 acres of suitable timber lands (per December 2005 Governor's roadless meeting materials).

*Minerals:* The southern two-thirds of the area has a low potential for coal development. Regional studies indicate that the area may contain limited hard rock minerals.

The southern two-thirds of the IRA has a moderate to high potential for oil and gas development. There are currently no existing oil and gas leases (per December 2005 Governor's roadless meeting materials).

Cultural resources: Very few cultural resource properties have been recorded in the area. Isolated lithics and lithic scatters do occur. Based on data from surrounding areas, there is a moderate to high likelihood of sites occurring in open parks and meadows, along drainages, and in level areas. There is a low to moderate chance of sites occurring in densely timbered areas and on steep slopes. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no other planned recreation, wildlife, or range projects in this area. Potential for terrestrial and stream habitat improvement projects exist in the area but none are planned.

Management considerations: None known

### **Availability Questions**

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? No development, but there is potential.
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: The area is available for wilderness designation.

#### Need

*Nearby wilderness:* The Turkey Creek roadless area is adjacent to the Weminuche wilderness on the north and west side.

*Limited representation cover types*: None known. The cover types represented in the Turkey Creek roadless area are presented in Table C.20 below.

Table C.20: Turkey Creek Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
	Acres	2,491	349	39	1,408	21,023	15	25,326
	%	10	1	0	6	83	0	100
Recommended for	Acres	241	6	0	29	301	0	578
Wilderness	%	36.3%	0.9%	0.0%	4.4%	58.4%	0.0%	100.0%

Wildlife needs: The area provides suitable habitat for lynx and wolverine and comprises an important biggame migration corridor.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. The LRMP does recommend 578 acres as a proposed addition to the Weminuche wilderness to enhance manageability.

Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

## WEMINUCHE ADJACENT (# SJ020) (CRA 320)

Contains Poison Park (RARE II 2290), Davis Mountain (RARE II 2288), Monk Rock (RARE II 2289), Martinez Creek (RARE II 2287), and Elk Park (not RARE II).

### Overview

Acres: 23,614

District: Columbine, Pagosa

History: This roadless area is a combination of numerous roadless areas adjacent to the Weminuche wilderness area. Several of the areas were studied under RARE II including Poison Park. The RARE II study recommended wilderness designation for 1,100 acres and that the remaining 7,960 acres be allocated to multiple use management. The Colorado Wilderness Act of 1980 added approximately 100 acres to the Weminuche wilderness, in the Middle Fork drainage. The Monk Rock RARE II study identified 2,260 roadless acres that were not recommended as wilderness. The Davis Mountain RARE II study identified 1,320 acres of roadless area that were not recommended for wilderness. The Martinez Creek RARE II study identified 6,420 acres of roadless area that were not recommended for wilderness. Additional areas were identified in the roadless inventory review done for the 2007 inventory done for the plan revision. It is appropriate to look at all of these roadless areas adjacent to the Weminuche wilderness together because they have similar characteristics. More specific information about location, access, physical description, vegetation, soil, and wildlife can be found in Appendix F of the Final Supplemental Environmental Impact Statement, SJNF, 1992 Elk Park was not studied during RARE II; however, the area is adjacent to the Weminuche wilderness and at 616 acres it is an NFS tract along the Animas River bounded on the north by the Colorado Trail on the east by the Durango Silverton Narrow Gauge Railroad. and Animas River and the rest of the boundary is Weminuche wilderness. Elk Park does have mining claims over nearly the entire area.

Location and vicinity: These roadless areas are described by an irregularly shaped boundary that includes ridge areas, major river drainages, and tributaries.

Access: Many points along the boundaries are located within 0.25 mile of NFS system roads and Forest Trails.

*Physical description*: These areas consist of narrow bands along the west and north sides of the Weminuche wilderness. These areas represent the toe slopes descending from the wilderness boundary.

The elevation range is between 8,000 and 12,000 feet above sea level.

*Vegetation:* The major overstory vegetation cover is mixed conifer (spruce, white fir, Douglas-fir) with aspen in the higher elevations and ponderosa pine at the lower elevations. These areas also contain some open grassy parks. Vegetation types do not significantly vary except for elevation changes, aspect, and slope orientation.

Soils: Geology of the area is the rocky moraines along the ridges and colluvial sedimentary rocks and shale along the narrow portion at top of the area. The soils are shallow to deep and subject to mass erosion along the cliffs as evidenced by the large mud flow that covered the Williams Creek and Poison Park roads in 1979. Soils along the ridges are shallow and are not prone to mass wasting.

Wildlife: Wildlife species inhabiting this area are typical of the species that are found throughout the SJNF portion of the southern Rocky Mountains. The mixed conifer vegetation type with its large variety of understory vegetation types makes this a prime area for many species. Bald eagles are the only known threatened species in the area. Cliffs provide peregrine falcon habitat. Bighorn sheep are known to winter in the area around Poison Park. Much of the area has suitable lynx habitat.

There are permanent streams that support fisheries habitat.

*Current uses:* Hiking and hunting are the two most popular dispersed recreation activities. The areas are also crossed by a number of wilderness users on the trails that lead into the Weminuche wilderness.

The adjacent areas are considered to be a primary recreation area with fishing streams, four large campgrounds, the state recreation area at Williams Creek Reservoir, and three trailheads for wilderness users. The private lands are used for ranching and these operators also have many grazing permits for grazing on the SJNF around and in the roadless area. The area is closed to summer motorized travel. Southern portions of the area along roads are open to winter snowmobile.

*Surroundings:* There is a wide variety of resource and land uses outside the roadless area on the non-wilderness NFS lands. There is a lot of incidental day use by visitors who are utilizing the popular areas and USFS campgrounds in the adjacent areas.

Key attractions: Middle Mountain, the Keyhole, the Notch.

#### Capability

#### **Environment**

Opportunity for solitude: Opportunity for solitude ranges from moderate to minimal because of the recreational activities, roads, and campgrounds.

Naturalness: These are smaller areas with few intrusions that affect naturalness.

Challenge: The campground and trailhead from Williams Creek encroaches one of the areas.

Outdoor recreation opportunities: Dispersed recreation such as hiking, hunting, and nature studies.

#### **Special Features**

Education: Williams Creek White Fir RNA and Martinez Creek RNA.

*Scenic features:* The Monk Rock area has three major scenic rock features and the Keyhole, which provides a scenic backdrop.

#### Manageability

Williams Creek White Fir RNA and Martinez Creek RNA.

Size: 23,614

Boundaries: These areas cannot be logically added to any other roadless areas although they are adjacent to an existing wilderness.

Conclusions: These areas are capable as wilderness and could be added directly to the existing Weminuche wilderness.

#### Availability

Recreation: Dispersed recreation such as hiking, hunting, and nature studies.

Wildlife: See Overview.

Water availability and use: No known issues.

Livestock operations: Several areas are in livestock allotments.

*Timber:* The Martinez Creek portion has 1,113 acres that are suitable timber lands (per December 2005 Governor's roadless meeting materials). The other segments are not in the suitable timber base.

*Minerals*: Based on past mineral activity it is not anticipated that there will be any mineral or oil and gas activity. However, mineral claims are present on Elk Park portion of the IRA.

No oil and gas leases. Potential for minerals is low to none.

Cultural resources: A small number of cultural resource sites have been located in the area. They consist primarily of isolated lithic artifacts and lithic scatters. The likelihood of finding additional sites is moderate to high along the streams and in the open meadows. The probability of finds in all other areas is moderate. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

Authorized and potential land uses: There are no planned recreation developments in the area; however, part of the Palisade horse camp encroaches on one of the roadless area parcels. There is opportunity for wildlife habitat improvement projects in these areas, but none are planned at this time. Those portions of the areas are included in an RNA, while another RNA is proposed. All RNAs will be managed in accordance with national direction and standards. There is no timber harvest activities currently planned, though portions of the area are suitable for timber.

Management considerations: 580-acre Williams Creek RNA, which was created as a representative sample of white fir forest. The Martinez Creek potential RNA, an old growth spruce-fir area, undisturbed for at least the last 500 years, is located approximately 9 miles of Pagosa Springs on the Pagosa Ranger District of the SJNF. It includes 1,062 acres of spruce-fir, subalpine wetland, and deciduous riparian forest cover types.

Monk Rock has a segment of the Piedra River's Middle Fork that is proposed for designation under the Wild and Scenic Rivers Act (along the western boundary of the area).

#### Availability Questions:

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? No
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? *No*
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: These areas are available for wilderness designation.

#### Need

Nearby wilderness: The Weminuche Adjacent roadless area is adjacent to the Weminuche wilderness on the western and southern boundaries of the wilderness area. Weminuche Adjacent would expand the ecological diversity of the Weminuche wilderness by adding grassy parks, stands of mixed conifer, and a reference site for white fir.

Limited representation cover types: The Williams Creek RNA, a representative sample of white fir forest, and the Martinez Creek potential RNA, an old growth spruce-fir forest. The cover types represented in the Weminuche Adjacent roadless area are presented in Table C.21 below.

Table C.21: Weminuche Adjacent Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
	Acres	6,370	1,939	692	1,909	12,698	6	23,614
	%	27.0%	8.2%	2.9%	8.1%	53.8%	0.0%	100.0%
Dagammandad	Acres	0	0	368	0	372	0	740
Recommended	%	0.0%	0.0%	49.7%	0.0%	50.3%	0.0%	100.0%

Wildlife needs: None known

*Conclusions*: The majority of these areas would not add significantly to the National Wilderness Preservation System. However, the addition of two tracts, Elk Park and Monk Rock, would allow for consistency in management and is recommended.

Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation.

Recreation use in the including mechanized travel would be allowed outside Elk Park and Monk Rock while maintaining the semi-primitive non-motorized character of the area.

#### WEST NEEDLES (SJ012) (RARE 2303) (CRA 303)

#### Overview

Acres: 6.881

District: Columbine

*History:* 15,800 acres of the original 24,550 RARE II roadless area were recommended for wilderness. These acres eventually were included in the West Needle WSA by the Colorado Wilderness Act of 1980 and were later added to the Weminuche wilderness area by the Colorado Wilderness Act of 1993. The balance was released to semi-primitive non-motorized recreation, motorized recreation, and livestock production under the 1983 LRMP.

Location and vicinity: The West Needle roadless area is located on the Columbine District in San Juan and La Plata Counties, east of U.S. Highway 550 from Molas Pass to the southeast of Electra Lake.

Access: Access to the area is via Colorado Highway 950, Lime Creek Road, 591, Haviland Lake Road, 671, and an unnumbered four-wheel-drive trail to Forebay Lake near Haviland Lake. The area is also accessible by the Durango-Silverton Narrow Gauge Railroad at Needleton. Cascade Creek Trail 511 and the Crater Lake Trail 623 are the two primary Forest Trails serving the area.

*Physical description:* The San Juan Uplift has characterized this roadless area, which contains rugged and steep terrain in the northern part and then slopes down to the southwest in a series of sedimentary benches. The mountains have been uplifted and subjected to glacial erosion and shaping.

The elevation range is 7,200 feet near the Animas River at the southern end up to 9,676 feet on northern end.

*Vegetation:* The area has a great amount of natural ecological and vegetative diversity resulting from variations in landform, soils, and geology. The drainage patterns, steep slopes, and rocky areas, which are characteristic of the area preclude the possibility that large continuous areas of a single vegetation type will ever dominate the area. Vegetation is mainly alpine and sub-alpine intermixed at lower elevations with deciduous and coniferous trees, with large natural openings and a mosaic of rock outcrops.

Soils: The geology of the area consists mostly of pre-Cambrian metamorphic and intrusive igneous rocks. Lower flanks of the mountains and canyon walls are veneered with talus, landslide deposits, and thin gravels. Rocks of the western half of the area are metamorphosed lava flows, called twilight gneiss. The southern two-thirds contain metamorphosed volcanics and sediments. Soil characteristics and production potentials within the area vary considerably as a function of landform, slope, and parent material.

*Wildlife:* Wildlife species presently found in the West Needle include the typical species of the southern Rocky Mountains. The area contains known lynx and bighorn sheep habitat. Bald eagle and osprey use electric lake. There are no known listed threatened or endangered species presently inhabiting the area. Habitat for pine marten, a species of limited population, is also found in the area.

Most lakes and streams in the roadless area contain fish. East Lime Creek is the only stream that has previous fisheries habitat improvement projects.

Current uses: There are no developed recreation sites within the area and no recreational structures other than trails. In the Purgatory Flats trails, a wide range of dispersed recreational activities take place. Some of the more common activities include driving for pleasure along the roads skirting the area to backpacking and rock-climbing. The area also provides one of the most scenic backdrops for the many motorists traveling along U.S. Highway 550 and for skiers using Purgatory ski area.

Surroundings: Most of the western boundary from Electra Lake to Cascade Creek is being developed with private subdivisions and homes. NFS lands adjacent to the area are managed to provide a wide variety of recreational activities and uses. Commodity uses such as timber sales and livestock production have not been emphasized in land management because of their potential visual impact to recreation uses along the U.S. Highway 550 corridor, Durango Mountain Resort (Purgatory ski area), and the many private homes and developments along the highway. U.S. Highway 550 has been designated a scenic byway, giving the area a national dimension of scenic and recreational importance.

Key attractions: The West Needle area incorporates the opposite side of the East Animas viewshed from the train route. The West Needle area would extend the Weminuche wilderness to the mid-elevation reaches of the Animas River.

#### Capability

#### <u>Environment</u>

Opportunity for solitude: Opportunities for solitude are low to moderate depending on the terrain between the user and the developments along the western side. The higher in elevation the IRA becomes, the more noticeable the impact from development along U.S. Highway 550. The Durango-Silverton Narrow Gauge Railroad affects the solitude in this area.

Naturalness: The West Needle area contains no facilities other than recreation trails. There have not been any recent wildlife habitat improvement projects or timber sales. A portion of the area was involved in the historic Lime Creek burn. Only a minor portion of the burn was replanted with spruce and lodgepole pine below the Lime Creek Road the reminder of the burn was allowed to naturally revegetate.

Challenge: None known.

Outdoor recreation opportunities: A wide range of dispersed recreational activities take place. Some of the more common activities include driving for pleasure along the roads skirting the area to backpacking and rock-climbing.

#### **Special Features**

Electra Lake RNA is proposed within this IRA.

Education: None known

Scenic features: The area is seen from both the San Juan Skyway and narrow gauge railroad.

Manageability Size: 6,881

Boundaries: This roadless area is adjacent to the Weminuche wilderness.

Conclusions: The area is capable as wilderness.

#### Availability

Recreation: Low visitor use occurs with some of the dispersed recreational activities being fishing, backpacking, and rock climbing.

*Wildlife:* The area contains known lynx and bighorn sheep habitat. Bald eagle and osprey use Electra Lake. The area contains habitat for pine marten.

Water availability and use: There are two dams within the IRA.

Livestock operations: The allotment that this IRA is in is currently vacant.

*Timber*: There are 204 acres of suitable timber lands within the roadless area (per December 2005 Governor's roadless meeting materials).

Minerals: Current mining activity, which is limited to a number of unpatented mining claims, is minimal. There are no applications or existing leases for leasable minerals. The potential for mineral deposits exists on the area, although there is little activity on existing claims. The geology indicates low potential for leasable minerals such as oil, gas, and geothermal resources. This section is completely surrounded by NFS lands and has been identified as highly desirable for acquisition by the USFS.

Low potential for oil and gas and coal is in this area. There are no existing oil and gas leases within the area (per December 2005 Governor's roadless meeting materials)

Cultural resources: Although no archeological field surveys have been undertaken in the area, it is possible that remnants of some small prehistoric camps exist. The area is considered to have low archeological sensitivity. There are some historic logging cabin (tie production) remnants in the area. The area was used for ties during the building the narrow gauge railroad. There are no known areas of interest that any tribes may have under the American Indian Religious Freedom Act.

The area is situated in the historic territory of the Ute Nations. Archival research and contacts with members of the Southern Ute and Ute Mountain Ute tribes, however, have not identified any specific sites important to the Ute peoples.

Authorized and potential land uses: There are no planned recreation developments in the area. Some trailhead and interpretive facilities are being constructed along the borders to serve the public traveling along the highway and/or those who may stop and enter the area for a variety of recreational activities. There are no planned timber sales or wildlife habitat improvement projects planned for this area. There are fuel treatment projects planned for the southern portion adjacent to Electra Lake. The NFS lands will be managed to maintain their roadless character.

Management considerations: The Electra Lake potential RNA is located 22 miles north of Durango on the Columbine Ranger District of the SJNF. It includes 2,265 acres of glacial topography set in the Las Animas River valley. The vegetation consists of ponderosa pine savanna, mixed conifer forest, aspen forest, and moraine wetland cover types. The area is used primarily for recreation, especially hiking.

#### Availability Questions:

- Is the area vitally needed for increased water protection and storage? Not known
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? There is potential for mineral activity.
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *Not known*

Conclusions: This area is available for wilderness designation.

#### Need

Nearby wilderness: West Needles is adjacent to the Weminuche wilderness.

*Limited representation cover types*: None known. The cover types represented in the West Needle roadless area are presented in Table C.22 below.

Table C.22: West Needle Area Cover Types

	Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Acres	5	120	0	202	6,648	74	7,049
%	0.1%	1.7%	0.0%	2.9%	94.3%	1.0%	100.0%

*Wildlife needs:* The area contains known lynx and bighorn sheep habitat. Bald eagle and osprey use Electra Lake. The area contains habitat for pine marten.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

#### WINTER HILLS/SERVICEBERRY MOUNTAIN (SJ 287) (CRA 287)

#### Overview

Acres: 5,114

District: Pagosa

History: None known.

Location and vicinity: West of Colorado Highway 84 near South San Juan wilderness.

Access: Colorado Highway 84 and NFS roads. The Serviceberry IRA is bordered on the west by private land and Colorado Highway 84. This CRA is separated from the South San Juan wilderness to the east by a series of timber harvest units along with ancillary roads. It is administered by the Pagosa Ranger District. The area is 0.25 mile or closer to eight NFS roads and Colorado Highway 84. There are no Forest Trails in the IRA.

Physical description: This IRA is within the South-Central Highlands Ecosection (M331G), with elevations ranging from 7,150 feet on the Blanco River to 8,420 feet at Winter Hills. The physical character of this roadless area is dominated by Serviceberry Mountain and Winter Hills. Interspersed throughout the forested areas are open grassland parks and occasional wet meadows. The area's water courses include numerous streams, all of which are tributaries of the Rio Blanco.

*Vegetation*: The range of elevation, slope, aspect, and soil types have resulted in ponderosa pine and oak as the dominant vegetation types. Interspersed throughout the forested areas are open grassland parks and occasional wet meadows.

*Soils*: The IRA surface geology is dominated by Picturecliff sandstone and Lewis Shale, while the soil types contain Hermette slit loam-Cortado, Boulderpark, Pargin, and Sixhorse Catchpole complex.

Wildlife: This area contains numerous wildlife species native to the southern Rocky Mountains. Deer, elk, turkey, black bear, and mountain lion use the area extensively. CPW has mapped this IRA as severe winter range for elk. The area is part of a major migration corridor for elk and mule deer. Due to its lower elevation, the southern aspects are used in the winter by Merriam's turkey.

Fisheries: Typical of southern Rocky Mountain perennial stream systems.

Current uses: Grazing. There are 400 acres leased for oil and gas development.

Key attractions: None known

#### Capability

#### Environment

*Opportunity for solitude:* The area is large enough to provide for some solitude, but sights and sounds of human imprints are evident in many places due to topography.

*Naturalness:* The area is primarily natural in appearance.

Challenge: None known.

Outdoor recreation opportunities: Hunting, wildlife viewing, backcountry hiking, and scenery.

#### **Special Features**

Education: None known

Scenic features: Excellent fall color viewing.

#### Manageability

Size: 5,115

Boundaries: Adjacent to Colorado Highway 84 and private lands on the west, general NFS lands on the

Conclusions: The area is capable as wilderness.

#### Availability

Recreation: See Capability section, above.

Wildlife: Black bear and winter elk range. The large amount of Gambel oak proves important fall forage for black bears.

Water availability and use: There are seven stock ponds, a guzzler, five reservoirs, one developed spring, a water pipeline, and a headgate within the IRA.

Livestock operations: Some grazing occurs within the area.

Timber: None historically, but timber harvest units bound the IRA on the east.

Minerals: None known.

*Cultural resources*: Previous cultural resource surveys in this roadless area have identified numerous sites and properties. Prehistoric finds have included isolated artifacts and lithic groups.

Authorized and potential land uses: Grazing allotments, municipal watershed.

#### **Availability Questions:**

- Is the area vitally needed for increased water protection and storage? This IRA is within a state defined source water assessment area (municipal water supply).
- Would wilderness designation seriously restrict important wildlife management measures? No
- Does the area have high strategic or economic mineral development potential? Yes, within the 400 leased acres.
- Are there unique or outstanding natural phenomena that require public access and development that would be inconsistent with wilderness designation? No
- Is the land needed to meet clearly documented resource demands such as for timber, minerals, or developed recreation sites including winter sports? *No.*
- Are there existing contractual or other significant obligations on the area not in concert with wilderness designation? *No*

Conclusions: This area is available for wilderness designation.

#### Need

Nearby wilderness: South San Juan wilderness.

*Limited representation cover types*: None known. The cover types represented in the Winter Hills/Service Berry roadless area are presented in Table C.23 below.

Table C.23: Winter Hills/Service Berry Mountain Area Cover Types

		Forbs	Grass	Bare	Shrubs	Trees	Water	Total
Ac	eres	282	131	0	1,897	2,804	0	5,114
0	<b>%</b>	6%	3%	0%	37%	55%	0%	100%

Wildlife needs: CPW severe elk winter range area.

Conclusions: This area would not add significantly to the National Wilderness Preservation System. Management under the Colorado Roadless Rule would protect roadless characteristics while allowing for management activities not allowed under wilderness designation. Recreation use including mechanized travel would be allowed while maintaining the semi-primitive non-motorized character of the area.

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# Appendix D Wild and Scenic Rivers Suitability

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Coyote Wash         32           Suitability Determination         34           Animas River System         36           Animas River – Bakers Bridge to Silverton         36           Cement Creek         41           Cinnamon Creek         45           Maggie Gulch         48           Mineral Creek         50           South Fork Mineral Creek (and portions of Cataract Creek, Porcupine Creek and unnamed tributaries)         55           West Fork Animas River in California Gulch         58           Suitability Determination         61           Hermosa Creek and Tributaries         63           Suitability Determination         68           Los Pinos River System         70           Los Pinos River and Tributaries above Vallecito Reservoir         70           Suitability Determination         73           Vallecito Creek         75           Vallecito Creek         75           Suitability Determination         77           Piedra River System         77           Piedra River System         77           Piedra River System         77           Piedra River System         78           East Fork Piedra River         86           Suitability Determination	McIntyre Canyon	27
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South Fork Mineral Creek (and portions of Cataract Creek, Porcupine Creek and unnamed tributaries)	Mineral Creek	50
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Hermosa Creek and Tributaries       63         Suitability Determination       68         Los Pinos River System       70         Los Pinos River and Tributaries above Vallecito Reservoir       70         Suitability Determination       73         Vallecito Creek       75         Vallecito Creek       75         Suitability Determination       77         Piedra River System       77         Piedra River       78         East Fork Piedra River       83         Middle Fork Piedra River       86         Suitability Determination       90         San Juan River System       92         West Fork of the San Juan River       92         Wolf Creek and Falls Creek       95         East Fork of the San Juan River       98         Suitability Determination       101         Wild and Scenic River Analysis       104         List of Streams Initially Evaluated for Eligibility       104	Suitability Determination	61
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## INTRODUCTION TO WILD AND SCENIC RIVER SUITABILITY

Under Section 5 (d)(1) of the Wild and Scenic Rivers Act (WSRA), federal agencies undertaking land management planning are required to assess whether any of the rivers and streams in the planning area would be appropriate for addition to the National Wild and Scenic Rivers System.

The process of designating a Wild and Scenic River (WSR) has four steps:

- 1. The U.S. Forest Service (USFS) and/or Bureau of Land Management (BLM) determine streams that are "eligible," and what each "classification" is.
- 2. The USFS/BLM Land and Resource Management Plan (LRMP) determines which streams are "suitable."
- 3. The USFS/BLM can choose when to forward "suitable" streams for legislative consideration.
- 4. Congress can "designate" a WSR.

Steps 1 and 2 are the subject of the Final Environmental Impact Statement (FEIS) and LRMP and are discussed below.

There is also an alternative process (under Section 2(a)(ii) of the WSRA) in which the state legislators and governor recommend a river and the Secretary of the Interior designates it as a WSR. That process is not considered in the FEIS and LRMP.

#### **Eligible Rivers**

The WSR analysis considered primarily third-order and larger streams located on the San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO). Some smaller order streams for which subject matter experts identified a potential outstanding remarkable value (ORV) were added, so that all values could be evaluated. The list of all streams evaluated is at the end of this WSR appendix.

Streams determined to be sufficiently free-flowing (i.e., not impounded by dams or significantly channelized) were analyzed to determine if they had ORVs. In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. ORVs can be related to scenery, recreation, geology, fish, wildlife, historical, cultural, or other values. Discussions with the Government Water Roundtable from September 2005 to February 2007 were useful in refining the ORV assessment. Members of the Water Roundtable provided information to help develop criteria for determining the significance of values. In addition, the Dolores River Dialogue (DRD) provided useful information and recommendations about streams located within the Dolores Public Lands Office area. Approximately 535 miles of streams on the SJNF and TRFO were found to be free-flowing and have one or more ORVs, and were determined to be "eligible" for the National Wild and Scenic Rivers System. The stream name and a brief listing of the ORVs are as follows. The column titled "Prev" indicates whether the segment (or a major portion of the segment) was previously analyzed and found suitable.

Table D.1: Stream Segments with Outstandingly Remarkable Values

Stream Name	Fish ORV	Wildlife ORV	Recreation ORV	Geology ORV	Scenery ORV	Ecological (plants) ORV***	Archaeology ORV
Dolores above McPhee	_	_	San Juan Skyway	_	_	_	_
Dolores McPhee to Bedrock*	Roundtail chub, flannelmouth sucker, bluehead sucker	Canyon treefrog	Boating	Cliffs, linear canyons	Cliffs, canyons, groves	New Mexico privet, Eastwood's monkey flower	Archeology
Rio Lado	High-purity cutthroat	_	_	_	_	_	_
West Dolores	_	Black swift nesting colonies	_	_	_	_	_
McIntyre Canyon	_	_	_	_	_	Eastwood's monkey flower	_
Bull Canyon	_	_	WSA, hiking to pools	_	_	_	_
Coyote Wash	_	-	WSA, hiking sandy wash	_	-	Kachina daisy, Eastwood's monkey flower	_
Animas River, Baker's Bridge to Silverton	_	-	Train, rafting/kayaking	_	Canyon, train	_	Historic sites, facilities, and railroad
Cement Creek	_	_	_	_	_	Iron fens	_
Cinnamon Creek	_	_	Alpine Loop	_	_	Altai cottongrass, thickleaf whitlowgrass	_
Maggie Gulch	_	_	_	_	_	Showy, Colorado Divide, and thickleaf whitlowgrass	_
Mineral Creek	_	_	San Juan Skyway	_	San Juan Skyway, wetland, colorful valley displaying geologic features	Chattanooga iron fen, sphagnum balticum	_
South Fork Mineral Creek	_	Black swift nesting colonies	_	_	_	Iron fen wetland	_

Stream Name	Fish ORV	Wildlife ORV	Recreation ORV	Geology ORV	Scenery ORV	Ecological (plants) ORV***	Archaeology ORV
West Fork Animas and California Gulch	_	_	-	_	_	Altai cottongrass, clustered sedge	_
Hermosa Creek and Tributaries	High-purity cutthroat and reintro-duction habitat	_	Hermosa Trail used by outfitters, hunters, mountain bikes, and motorized vehicles	_	_	_	_
Los Pinos above Vallecito*	_	-	Heavy-use trail	_	Scenic valley	_	_
Los Pinos Tributaries previous recommend- ation*		_		_	Scenic valley	_	_
Vallecito Creek	_	-	Heavy-use trail, kayaking	_	Canyon, surroundings	_	_
Piedra River, Chimney Rock area to Forks*	-	_	Whitewater boating, fishing	Headwaters complex	Box canyons, hot springs	_	Prehistory
East Fork Piedra River	High-purity cutthroat	-	_	_	Waterfalls	_	_
Middle Fork Piedra River*	_	-	General recreation	General geology	General scenery	_	_
West Fork San Juan River	_	-	_	San Juan volcanic field, glaciation	_	_	_
Wolf Creek and Fall Creek	_	Black swift nesting colonies	_	_	Treasure Falls	_	_
East Fork San Juan River	_	_	-	Textbook glaciation and volcanics	_	_	Archeology

<sup>\*</sup>Streams that were previously recommended for inclusion in the National Wild and Scenic Rivers System.

#### **Characteristics of Eligible Rivers**

Eligible rivers are then classified by their development level, which assesses water resource and shoreline development and amount and kind of access. The WSRA calls the three development classifications "wild," "scenic," and "recreational." A river's classification does not represent the values for which it was added to the National Wild and Scenic Rivers System. For example, a "recreational" river segment denotes a level of in-corridor and water resources development and does not necessarily mean that the recreation resource has been determined an ORV. Similarly, a recreational classification does not imply that the river would be managed for recreational activities. For example, there are rivers in the National Wild and Scenic Rivers System paralleled by a road and hence classified as recreational for which the ORV is the fish resource.

Table D.2 gives some examples of the type of development that would fit into each classification.

Table D.2: Example Development Types by Classification

Activity	Wild	Scenic	Recreational
Livestock grazing	Yes	Yes	Yes
Inconspicuous or historic buildings	Yes	Yes	Yes
Housing subdivisions and stores	No	No	Yes
Timber harvest	No	Yes	Yes
Trails	Yes	Yes	Yes
Occasional road crossings and bridges	No	Yes	Yes
Parallel roads or railroads	No	No	Yes
Low dams and diversions	No	No	Yes

Further information about compatible projects on federal land is found in Forest Service Manual (FSM) 1909.12, Chapter 80.

On the SJNF and TRFO, eligible stream segments that were classified are shown in Table D.3.

Table D.3: River Miles by Classification

Classification	Wild	Scenic	Recreational	Total
Miles	200	82	253	535

Many of the eligible rivers are already in wilderness, similar Congressional designation, or BLM wilderness study areas (WSAs) (Table D.4).

Table D.4: Miles by Designation

Miles in Wilderness	Miles in Piedra Area	Miles in WSAs	Other	Total
104	10	37	384	535

Many of the stream corridors studied included some intermingled private lands. Analyzing or managing a river for WSR status does not give or imply any government control over private lands. If Congress were to designate a stream as a WSR, there would be no federally imposed management restrictions on private land. Using condemnation to acquire fee title to land is not authorized. Use of condemnation to acquire easements is permitted but is extraordinarily rare in the western United States.

If streams have long segments through private land, it may be more complicated for the federal agency to manage the federal portion as a WSR. This is one of the factors considered in the suitability analysis. For the total of all eligible segments, Table D.5 lists the miles of streams under different land ownerships.

Table D.5: Miles by Land Ownership

USFS	BLM	State	County, etc.	Private	Total Miles
294	129	5	6	102	535

Note: In this and all other tables, ownership is listed for the full length of the segment, but decisions and management recommendations are for USFS and BLM lands only.

In the LRMP and FEIS, decisions are made as to which of these eligible streams are considered "suitable" for inclusion into the National Wild and Scenic Rivers System.

#### **Introduction – Suitability Analysis Process**

Suitability is designed to answer these questions:

- 1. Should the river's free-flowing character, water quality, and ORVs be protected, or are one or more other uses important enough to warrant doing otherwise?
- Will the river's free-flowing character, water quality, and ORVs be protected through designation?
  Is designation the best method for protecting the river corridor? In answering these questions, the
  benefits and impacts of WSR designation must be evaluated and alternative protection methods
  considered.
- 3. Is there a demonstrated commitment to protect the river by any non-federal entities that may be partially responsible for implementing protective management?

The factors considered in answering these questions that are discussed by individual streams later in this document are:

- Characteristics that do or do not make the area a worthy addition to the national system.
- 2. The current status of land ownership and use in the area.
- 3. The reasonably foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the national system.

The factors that are considered that are the same for all rivers are listed and answered below:

- 1. The federal agency that would administer the area should it be added to the national system.
- 2. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state and local agencies.
- 3. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area should it be added to the national system.
- 4. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the national system.

At this time, the SJNF and TRFO are envisioned as the federal agencies to administer any suitable rivers that may be designated within their respective boundaries. There has been no need identified to acquire any land or interest in land. Between these findings of suitability and the actual recommendation of a river for designation, the interest of other entities and agencies to participate in management of the river would be confirmed. The "Suitability Determination" by river system shows the segments that are found suitable in the Preferred Alternative, FEIS Alternative B.

If any of the rivers found in this planning process to be suitable were to be designated as WSR by Congress or the Secretary of the Interior, a federal water right would be created. Typically, the quantification of the federal reserved right is left to the federal agency that manages the river. The agency conducts studies to determine the minimum flow rates needed to support the ORVs. Then the federal agency submits an application containing the proposed quantification to a state court for confirmation and integration into the state water rights system. This quantity would have an appropriation date as of the date of the legislation and would be junior to all existing water rights. Future diversions or proposed changes to existing diversions from the wild and scenic segment, or from tributaries or upstream reaches, could be challenged by the federal agency holding the water right, as well as by other water rights holders should there be potential injury to their water rights.

## Collaboration with State and County Government and the Government-to-Government Water Roundtable

As part of the suitability analysis process, input was received from the Colorado Department of Natural Resources. Information provided by the Colorado Division of Water Resources, Colorado Parks and Wildlife (CPW), and the Colorado Water Conservation Board was incorporated into the assessment of suitable streams on the SJNF and TRFO. This analysis also acknowledges information generated by the Statewide Water Supply Initiative, basin roundtables, the government-to-government Water Roundtable and the Interbasin Compact Process. The Southwest Basin Roundtable established through Colorado H.B. 05-1177 is tasked, in part, with developing a basin-wide consumptive and non-consumptive water supply needs assessment. At the writing of this appendix, the Southwest Basin Roundtable had not yet completed its assessment or identified priorities. Future reports of this roundtable would be made available as additional information to be reviewed if WSR recommendations are made to Congress.

Following the initiative of the Southwest Water Conservation District and the San Juan Citizens Alliance, the River Protection Workgroup Steering Committee was organized to develop and make available a general process for facilitated community discussions of the need for and options to accomplish river protections. The stated purpose of this multi-year effort is:

- "to bring diverse stakeholders together in a collaborative process to determine values needing protection ecological, economic and social;
- to recommend the types of tools necessary, either existing or newly-developed, to protect the values: and
- to make recommendations in the context of striking a balance between the protection of natural values and water development."

Using the assistance provided through the River Protection Workgroup Steering Committee's effort, community members chose to establish separate workgroups to discuss potential river protections for seven major streams and their specified tributaries. Individual workgroups considered portions of Hermosa Creek, Vallecito Creek and the Pine River, the West and East Forks of the San Juan River, the Animas River, and the Piedra River. To date, numerous publicly advertized meetings have been held to discuss each of these river segments and workgroups have prepared public reports of their findings for Hermosa Creek, Vallecito Creek and the Pine River, and the East and West Forks of the San Juan River. Community discussions continue for the remaining river segments. The published reports stemming from these multiple efforts have and would be directed toward potential steps that local, state, and federal governmental entities, and possibly even private citizens, could consider to balance the perceived needs for protecting values related to rivers and the long-term need for water and water development.

A separate, but similar, public process has been in place for the Dolores River for a number of years. The stated purpose of the DRD and related subgroups is "to explore management opportunities, build support for and take action to improve the ecological conditions downstream of McPhee Reservoir while honoring water rights, protecting agricultural and municipal water supplies, and the continued enjoyment of rafting and fishing" (Dolores River Dialogue 2013). A closely related group is the Lower Dolores Plan Working Group that has been identifying issues, compiling scientific information, and discussing possible management options to be considered as the federal agencies update management plans for the Lower Dolores River. As with the river protection workgroups, the work of the DRD and related groups has been publicly advertised and reported, and has involved diverse interests from throughout the region.

While the topics and findings of these various community efforts extended well beyond the potential WSR studies of the USFS and BLM, much of the information they have produced and made available to the public confirms or otherwise informs the analysis presented in this appendix. The findings of these groups do not constitute significant new information in terms of the required analyses of potential WSR suitability under Section 5 (d)(1) of the WSRA and related agency guidance. The findings of the groups have and may yet suggest alternative approaches to river protection that fall outside the authority of the federal agencies (e.g., separate legislative protections or additional county planning) but could eventually augment or substitute for the administrative recommendations for WSR designation stemming from the analysis in this appendix. Therefore, the analyses presented below acknowledge the relevant findings of

these community efforts and how they might relate to the administrative recommendations for WSR designation.

Through the Draft Environmental Impact Statement (EIS), public input was sought specifically on how the results of collaborative efforts such as the DRD and the Lower Dolores Plan Working Group should be considered as the BLM and USFS address the Section 5(d) requirements of the WSRA in this LRMP revision. Comments received were generally very supportive of the community efforts and encouraged the agencies to make use of the science-based information being collected in support of these efforts and to give consideration to the river management ideas being surfaced by their efforts. Some comments suggested that final suitability determinations should be postponed until individual river groups have completed their processes. A similar comment suggested that a "reopener clause" be added to suitability findings to later accommodate findings of community-based efforts in regard to alternatives to WSR suitability. While delaying WSR determinations and providing for reopeners fall outside agency guidance for considering eligibility and suitability in land management planning, the analyses below acknowledge the work that various groups have been doing in relation to river protection to highlight that alternatives to WSR designation have been, or are being, developed and would be made available to inform agency or congressional actions that may follow the determinations of suitability presented in this appendix.

The individual river segments analyses below identify generally how public comments were considered in reaching suitability determinations. Specific comments responses are presented in Volume III, Appendix S

# PROCEDURAL STEPS FOLLOWING COMPLETION OF THE LAND AND RESOURCE MANAGEMENT PLAN AND USE OF THIS APPENDIX

The procedures for forwarding WSR proposals stemming from land management plans are very similar for both the USFS and BLM. Guidance from both agencies encourages the development of a standalone appendix to the LRMP and FEIS that can be forwarded to the Chief of the USFS or the Director of BLM, and then to the respective Secretaries before the administration makes any final recommendations to Congress for their consideration. For instance, the BLM's guidance states: "This appendix should be self-contained so that, given a final decision to forward a recommendation to Congress, it can be extracted to support any legislative proposal" (BLM Manual 6400.4.1(C)). This Appendix D is intended to fulfill that requirement. Further consideration of the determinations identified under the Preferred Alternative would involve review of this appendix. For that reason, this appendix highlights where community-based river discussions have been focused to ensure that parties involved in subsequent consideration of WSR recommendations presented in this LRMP and FEIS are fully aware of community processes that may have produced suggestions for river management.

## MANAGEMENT OF ELIGIBLE RIVER SEGMENTS FOLLOWING SUITABILITY DETERMINATIONS

River segments found suitable in the final decisions for the BLM and USFS land management plans would be subject to interim management protections found in BLM Manual 6400 Sections 3.5 and 3.6, and Forest Service Handbook (FSH) 1909.12 Chapter 80. This guidance outlines approaches and guidelines to be followed to ensure that suitable rivers are managed to protect their free-flowing condition, water quality, tentative classification, and ORVs until Congress chooses to designate the river or release it for other uses. In the event that no legislative action is taken to designate or release the river, the agencies would continue to protect the river segments until suitability determinations are revisited in future land use planning efforts.

Eligible river segments determined not to be suitable would be released from further management protections under the provisions of the WSRA and would be managed according to the prescriptions found in the respective land use plans.

The record of inventory for eligibility presented in this appendix would be retained for future land use planning efforts (e.g., plan revisions) where WSR eligibility findings or suitability determinations are required under the WSRA (Section 5(d)).

#### **Dolores River System**

Eligible portions of the Dolores River and tributaries, and their classification, are as follows. Details for each segment are below (Table D.6).

**Table D.6: Miles per Eligible Segments** 

	Wild	Scenic	Recreation	Total
Dolores above McPhee	_	_	55.55	55.55
Dolores River - McPhee To Bedrock	48.84	23.15	37.04	109.02
Rio Lado	_	2.83	_	2.83
McIntyre Canyon	_	5.82	_	5.82
Summit Canyon	_	12.15	_	12.15
Bull Canyon	1.44	4.94	_	6.38
Coyote Wash	7.60	_	_	7.60

	Wild	Scenic	Recreation	Total
West Dolores	5.17	_	28.54	33.71
<b>Dolores Totals</b>	63.05	48.89	121.13	233.06

#### Dolores River above McPhee Reservoir

**Location:** The river above McPhee Reservoir was studied from where it became a third-order stream at the head of the East Fork down the mainstem to the reservoir. A 0.25-mile corridor on either side of the stream was also studied. The portion of the stream from the headwaters to McPhee Reservoir is 55.55 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs. Above Taylor Creek the Colorado Water Conservation Board holds an instream flow right, which would tend to maintain the free-flowing nature of the stream.

**Wild and Scenic Classification:** This entire segment is classified as a recreational use because it is readily accessible by road. This classification was chosen because the San Juan Skyway runs along the river for the majority of the segment. At the headwaters there is a four-wheel-drive road that follows the river.

**Land Ownership:** Land ownership is split between National Forest System (NFS) lands, non-Federal land (state, county, town), and private land (Table D.7 and Table D.8).

**Table D.7: Ownership along Linear River Miles** 

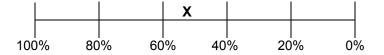
NFS	Non-Federal	Private	Total	% NFS
24.61	0.19	30.75	55.55	44.3%

Table D.8: Ownership within the 0.5-mile River Corridor in Acres

NFS	Non-Federal	Private	Total	% NFS
9,556.62	5.28	7,615.67	17,177.57	55.6%

The amount of private land changes along this corridor. North of the Montezuma/Dolores County line there is less private land in the corridor, and there are somewhat fewer conflicts. South of the county line there is more private land and more potential for conflicts of many kinds. Future analysis of this river may want to break it into several sections.

#### Amount of federally owned land within the River Corridor



#### **Outstandingly Remarkable Values**

**Recreation:** The San Juan Skyway National Scenic Byway is a nationally designated road that parallels the river. Visitors driving the San Juan Skyway are treated to views of the verdant river floodplain flanked by sculpted red sandstone and thriving aspen stands on the valley sides. The skyway attracts national and international visitors.

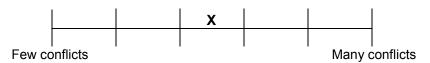
#### **Existing and Potential Land Uses**

The NFS land in the river corridor is managed for a variety of uses, including the viewshed of the San Juan Skyway National Scenic Byway. Most of the federal land in the corridor would be managed as a recreation-emphasis theme. The area around Rico would have a special theme related to the activities around the town. The upper portion away from the highway would be managed as a natural landscape

with limited management. This is compatible with the recreation classification and the protection of the recreation ORVs.

According to the Montezuma County Comprehensive Land Use Plan for the Unincorporated Areas of Montezuma County (Montezuma County 1997), the majority of the private land is classified as agricultural with a density of one dwelling per 30-acre parcel. There are 2.2 miles of stream, which account for 675 acres of private land, classified as agricultural with a density of one dwelling per 20 to 30 acres. There are 1.54 miles of stream, which account for 507 acres of private land, classified as agricultural with a density of one dwelling per 10 to 20 acres. This type of development would not interfere with the recreational classification of the river. The rest of the private land is in Dolores County. The Dolores County Master Plan (Dolores County 1997) does not classify the land within the county; therefore, the building density is unknown in this area except in the town of Rico. The Rico Regional Master Plan (Town of Rico 2004) designates five classifications within the river corridor. These are the Rico Renaissance Planned Unit Development area, Rico Renaissance Open Space, Rico Renaissance (within the Urban Growth Boundary), Sundial Planned Unit Development area and Single Family Residential (one residence per three acres).

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

Ores rich in silver, lead, and zinc, with modest gold and copper, have been mined from deposits in the Rico mining district since 1879. There is no current production. The area around Rico is favorable for stockwork molybdenum, porphyry copper-molybdenum, and polymetallic replacement and skarn deposits. The area below Rico is favorable for placer gold.

There is no oil or gas production, and potential for oil and gas is low.

There are numerous gravel pits (active and reclaimed) along the river corridor.

#### Potential for conflict with minerals



#### Water Resources Development

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists 45 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 77.416 cubic feet per second (cfs).
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 3.11 cfs.
- 3. The Colorado Water Conservation Board (CWCB) undertook a State-wide Water Supply Initiative (SWSI). Additional supply for the town of Rico is listed in SWSI Section 6 (Identified Projects and Processes) and could impact this river. The SWSI has mapped one potential reservoir site on a tributary to the Dolores River, but it has not been verified for feasibility.

There are occasional headgates and low dams associated with these diversions. In addition, short sections of riprap protect State Highway 145 from erosion on the outside some bends on the river.

Additional riprap may be present on private land to protect fields from erosion on the outside bends. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



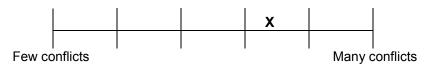
#### **Transportation and Facilities**

State Highway 145 is within the Dolores River Corridor for 46 miles. This road is paved. In addition to the highway there are 5.7 miles of roads maintained for passenger cars in USFS campgrounds and roads leading out of the corridor. There are also 2.9 miles of roads on NFS lands not maintained for passenger cars, as well as numerous additional roads on private land.

Seven miles of non-motorized trails and 1.6 miles of motorized trails are located within the river corridor. In addition to the roads and trails, there are also a number of facilities found within the river corridor. The USFS facilities are Cayton Campground, Rico Visitor Center, Priest Gulch Trailhead, and Bear Creek Trailhead. There is also a power line and pipeline corridor crossing the Dolores about a mile below its confluence with the West Fork.

The towns of Rico and Dolores are also in the river corridor. Within the towns and in other areas on the river corridor there is residential, commercial, and recreational development on private land.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

There are many recreation opportunities along the Dolores River above McPhee Reservoir. These include driving the San Juan Skyway, camping (dispersed and developed), hiking, mountain biking, fishing, horseback riding, hunting, rafting, and kayaking. This section of the Dolores River is also listed as a good fishing area in the Fisher's Guide to Colorado (Bartholomew 1998).

Other activities that may occur in the area include agriculture, livestock grazing, timber, harvest and mining.

#### Potential for conflict with recreation and other resources



North of the Montezuma/Dolores County line there is less private land in the corridor, and there are somewhat fewer conflicts. South of the county line there is more private land and more potential for conflicts of many kinds.

#### **Special Areas**

Much of this segment is paralleled by the San Juan Skyway. The proposed Grizzly Peak Research Natural Area (RNA) is adjacent to this segment.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major economic base in Montezuma County is retirees (39%) and the major economic base in Dolores County is agribusiness (33%).

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The Dolores River above McPhee Reservoir was not found to be suitable in the Preferred Alternative. While there are significant recreational values of the river corridor, there are many existing and potential uses along the river that would conflict with a designation under the WSRA. In particular, the intermingled federal and private ownership and substantial private ownership of this reach, the great number of water rights and diversions, numerous existing and historic sand and gravel operations, and the many roads and bridges along this reach counter-balance the ORVs of the stream. Comments were received both in support and in opposition to this finding, but generally did not provide additional information to be considered.

Land use planning at the county and local government level and in LRMP revision would generally be compatible with a recreation classification of this river segment and would provide some protection of the recreation ORVs identified. At the present time there is instream flow protection (20 cfs) provided for a portion of this reach by the CWCB. WSR designation could perhaps enhance protection of the free-flowing character of the stream but would not add significant levels of protection for the recreation ORVs because of the extent of private lands involved and the existing levels of development in the corridor. Other options for protecting the recreation values include the present focus placed on the scenic river corridor by national scenic byway classification and the continued protections afforded by county and local government planning. The land ownership patterns and development patterns along nearly this entire river segment would preclude alternative protections such as wilderness designation. Only the uppermost portions of the stream could be protected directly and indirectly by RNA designation and roadless area management discussed in the LRMP revision.

#### Dolores River - McPhee Reservoir to Bedrock

**Location:** The river was studied from the outlet of McPhee Reservoir to Bedrock. The portion of the stream from the outlet of McPhee Reservoir to Bedrock is 109.09 miles. The segment was determined to be sufficiently free-flowing and possess sufficient water quality to support the ORVs.

**Wild and Scenic classification:** The segment has a number of different eligibility classifications, which can be found in Table D.9 in miles.

Table D.9: Dolores River-McPhee Reservoir to Bedrock (miles)

Wild	Scenic	Recreational	Total
48.3	23.1	37.0	108.5

<sup>\*</sup>Segment adjusted to exclude roads from wild segments.

The following discusses the river segments and their classification starting from McPhee Reservoir.

- From McPhee Reservoir to Bradfield Bridge is recreational, with numerous campgrounds and a parallel road.
- From Bradfield Bridge to the Dove Creek Pump Station is wild. There is no road, no developed or maintained trail, and the area is closed to motorized uses.

- From the Dove Creek pump station to Disappointment Creek is scenic. The Snaggletooth Road is
  in the corridor, but it has only short portions of obtrusive road; for or the most part, the
  Snaggletooth Road is unobtrusive.
- From Disappointment Creek to below Slickrock near McIntyre Creek is recreational, with the community of Slickrock and many county roads.
- From below Slickrock near McIntyre Creek to the Little Gypsum Bridge at the start of the WSA is also recreational.
- From Little Gypsum Bridge at the start of the WSA to a point about 2.5 miles above Bedrock is wild. This section is in the WSA.
- From where the river exits the WSA to Bedrock, a segment that is about 2.5 miles, the river grades from mostly wild to being flanked by campgrounds and industrial plants. This section is classified as recreational.

The BLM administrative boundaries split the WSA. Decisions about the portion of the river administered by the Montrose Field Office (approximately 6 miles) are not being made in this document, but the analysis is presented for the longer segment.

**Land Ownership:** Land ownership is split between BLM, CPW, NFS, non-Federal (county, town), and private land. Table D.10 is a breakdown of the miles of stream by ownership.

Table D.10 - Miles by Ownership

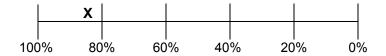
BLM	CPW	NFS	Non- Federal	Private	State	Total	% NFS	% Federal (NFS+BLM)
84.25	0.94	5.53	0.18	12.82	5.30	109.02	5.1%	82.3%

Table D.11 is a breakdown of the ownership within the river corridor in acres.

**Table D.11 - Acres by Ownership** 

BLM	CPW	NFS	Non- Federal	Private	State	Total	% NFS	% Federal (NFS +BLM)
25,092.61	332.52	2,339.50	48.77	3,005.05	1,195.24	32,013.69	7.3%	85.7%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

This section of the Dolores River contains many ORVs.

**Recreation and Scenery:** This section of the river is listed as one of the most popular and beautiful rafting areas in southwest Colorado. It contains Class II, III and IV rapids. The river is in a wild and deep canyon that combines red sandstone cliffs with coniferous forests (Anderson and Hopkins 1982). It is also regionally significant for boating recreation, based on observations of actual use and interviews with regional recreation providers. It is also listed in the Nationwide Whitewater Inventory, American Whitewater, 2006, even though it is more of a scenic float trip than a whitewater experience.

The scenic values are associated with recreation. The river corridor contains cliffs, canyons, and old growth ponderosa pine groves.

**Fish and Wildlife:** This segment contains occupied roundtail chub (*Gila robusta*), flannelmouth sucker (*Catostomus latipinnis*), and bluehead sucker (*C. discobolus yarrowi*) habitat. Roundtail chub is a species of special concern because it is a sensitive native species and qualifies as wild stocks and/or federal or state listed or candidate threatened, endangered, or sensitive species. The flannelmouth and bluehead suckers have been added to the ORVs since the Draft EIS based on comments that suggested the three species should be considered together, as they are in the Range-wide Conservation Agreement and Strategy (Utah Department of Natural Resources 2006) signed by six state wildlife agencies, the BLM State Directors of Colorado and Wyoming, the National Park Services' Intermountain Region, and the Jicarilla Apache Nation. Comments were also received from multiple other interests suggesting that the three species should be considered together based on the scientific information that has been compiled. Roundtail chub is on the USFS and BLM Colorado sensitive species lists and is considered by CPW as species of special concern.

This segment also contains a population of canyon tree frog (*Hyla arenicolor*), which has a state ecological rating of 2, meaning that it is rare or imperiled within the state. The species is also listed as a BLM Colorado Sensitive Species. The tree frog was previously identified as a state species of concern, but is now identified as "effectively conserved" in the Colorado Natural Heritage Program's Scorecard presented in the State of Colorado's Biodiversity (Colorado Natural Heritage Program 2011). Canyon tree frogs occur along streams in deep rocky canyons. Tree frogs are most active at night but are frequently found during the day resting in small depressions in solid rock near pools of water. They breed in canyon bottom pools often bounded by solid rock.

**Geology:** There are dramatic Cretaceous sandstone cliffs throughout the canyon, and in some areas the geology has confined the canyon to a uniquely persistent linear and angular form. The northerly flow of this river is rare within the region of comparison, and documents the uplift of the Colorado Plateau and the subsidence of the adjacent Paradox Basin, These two geological events also determine the unusual gradient of the river. The action of the Dolores River by penetrating the hard caprock of the present-day cliffs and the linear flow pattern of its canyon demonstrate the unusual rapidity of the area's tectonic processes and the speed of the corresponding downward cutting of the river, which in turn documents the geologic timescale history of water supply in southwest Colorado.

**Ecology:** The segment contains the New Mexico privet (*Forestiera neomexicana*), which is extremely rare or imperiled globally, and Eastwood's monkeyflower (*Mimulus eastwoodiae*), which is extremely rare or imperiled within the state and rare globally.

**Archeology:** Several rare and exemplary prehistoric archeological sites are preserved immediately adjacent to the Dolores River in Colorado between McPhee Reservoir and the small town of Bedrock. The sites range in composition from large Anasazi pueblos such as Mountain Sheep Point Village and the Kayenta House cliff dwelling to sacred sites such as the rock art panel at the mouth of Bull Canyon. These archeological sites evidence at least 11,000 years of inextricable connection between the Dolores River and the area's human inhabitants.

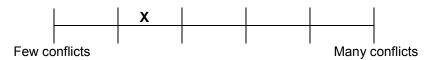
#### **Existing and Potential Land Uses**

Most of the federal land in this corridor is managed and would continue to be managed as a special theme emphasizing the river and canyon opportunities. The portion in the WSA would continue to be managed to preserve its wilderness character. This is compatible with the numerous ORVs in this corridor.

According to the Montezuma County Land Use Plan for the Unincorporated Areas of Montezuma County (Montezuma County 1997) the private land along the Dolores River in Montezuma County is classified as agricultural with a density of one dwelling per 30-acre parcel. This type of development would not interfere with the recreational classification of the river. There is also private land within Dolores County. The Dolores County Master Plan (Dolores County 1997) does not classify the land within the county; therefore, the building density is unknown in this area. The remainder of the private land is within San Miguel and Montrose Counties. According to the San Miguel County Comprehensive Development Plan (San Miguel County 2001), the private land within the river corridor in San Miguel County is classified for

natural resources, agriculture, and recreation. There is a small area of residential development within Slickrock. The private land in Montrose County is located near Bedrock and is classified as agricultural according to the Montrose County Master Plan (Montrose County 2010). These classifications should not interfere with the recreation and scenic classifications.

#### Potential for conflict with existing and potential land uses

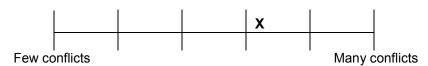


#### **Mineral Potential**

The Slickrock uranium district encompasses the Dolores River, as it passes through most of San Miguel County, giving it high potential for uranium. There is active uranium leasing in the vicinity of this stream.

The oil and gas potential is high for the Dolores River in San Miguel and Montrose Counties. Oil and gas potential is moderate as it runs through Dolores County and low as it approaches McPhee Dam.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 13 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 11.8 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 7.41 cfs and 6.5 acre feet.
- 3. The SWSI report shows two conditional water rights in this stream. The SWSI has also identified reservoir sites on Beaver Creek and Plateau Creek that flow into McPhee Reservoir that could be operated to increase flows in the Dolores River below McPhee Reservoir. Beaver Creek and Plateau Creek reservoir sites are a high priority for the Southwest Basins Roundtable of the Colorado Interbasin Compact Committee. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There are occasional headgates and low dams associated with these diversions. Additional riprap may be present on private land to protect fields from erosion on the outside bends. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

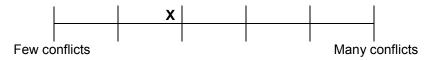
From McPhee Dam to Bradfield Bridge there are 15.3 miles of road that are maintained for passenger cars. There are also three campgrounds within the river corridor: Ferris Canyon, Cabin Canyon, and Bradfield campgrounds.

The section from Bradfield Bridge to the Dove Creek pump station has no roads or trails.

The section from the Dove Creek Pump Station to Slickrock has 30.2 miles of primitive and four-wheel-drive roads that are not maintained for passenger cars. There are also 2.6 miles of road maintained for passenger cars, 1.1 miles of all-terrain vehicle (ATV) trails, and 1.0 miles of road closed for revegetation. An additional 9.9 miles of road near Slickrock are local roads.

From Slickrock to the WSA there are 11 miles of road listed as local roads. In the WSA there is about 1 mile of road listed as local roads, which may be closed. There are also roads near Bedrock that have not been quantified because they are out of our coverage area.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

There are rafting opportunities through beautiful and unusual scenery and geology. There are also numerous hiking trails into the canyon and an overlook near Dove Creek. The area is used for camping, both in campgrounds and dispersed areas. There are also ATV trails along the river.

Other activities that occur include livestock grazing.

#### Potential for conflict with recreation and other resources



#### Special Areas

A portion of the river is in a WSA. This river was also previously recommended for WSR designation.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in Dolores County is agribusiness (33%). This consists mainly of agricultural production. The second highest segment of the economic base is expenditure of outside dollars by retirees and commuters who work outside Dolores. This is related to the Dolores River as it is diverted for irrigation.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

This segment of the Dolores River is determined to be suitable for WSR designation under the Preferred Alternative. On the lowest portion of the river, the BLM Uncompander Field Office has decision-making and on-the-ground management responsibility. This river reach contains many ORVs, has relatively few conflicts between river protection and other uses, and primarily involves federal lands. The principal

conflicts between river protection and other uses of the corridor involve mineral development. Existing water developments would not significantly conflict with designation, and at least some of the foreseeable water developments could enhance river-related values. This determination is consistent with previous findings of suitability for this river segment.

The LRMP revision provides for continued protection of many of the identified river values by proposing management under a special theme emphasizing river protections and opportunities for use. A portion of this stream segment falls within a BLM WSA that was previously recommended to Congress for designation under the Wilderness Act. This planning effort and FEIS have also considered options for protecting relatively small portions of the study segment through Area of Critical Environmental Concern (ACEC) designation. Potential ACEC designations considered through the FEIS could protect portions of the river corridor, but would not provide substantial protection to the overall river segment or all of the ORVs identified. Additional protections for the river segment considered through the FEIS include several oil and gas lease stipulations and other LRMP components that would come into play when considering specific project proposals. Interim management protection of the Dolores River Canyon WSA does provide a substantial level of protection to a relatively short length of the river segment in the lowest reaches. Again, these rather site-specific protections would not necessarily apply to the entire stream segment, nor would they fully protect the identified ORVs.

The Special Recreation Management Area (SRMA) concept included in all of the action alternatives of the FEIS would provide protection of some of the ORVs for a major portion of the stream reach. This designation emphasizes the recreation benefits of the river corridor, which are very closely connected to several of the identified ORVs. The designation of an SRMA does not, however, represent the more enduring protection that could be achieved through WSR designation. An SRMA designation could be modified or ended by future LRMP revisions or amendments and does not, in itself, ensure protection of all of the ORVs or the free-flowing character of the river.

WSR protections would specifically address the ORVs of recreation, scenery, fish, wildlife, geology, ecology, and archeology and have been found to be the best option within the authority of the agencies for protecting the river segment's free-flowing character and ORVs. WSRA protections would prevent construction of new water storage developments within the corridor, benefitting all of the identified ORVs. WSR designation would be accompanied by a federal reserved water right. However, given that nearly all of the flows in the lower Dolores River have previously been appropriated, including the state instream flows, a new federal reserved right would have little direct benefit in terms of further preserving flows. Designation of the river by Congress could, however, assist ongoing efforts to manage existing flows for some of the ORVs or to enhance instream flows working through participation of willing parties.

There are several alternatives to WSR designation falling outside the direct authorities of the two managing agencies that could achieve similar protections for the stream and its ORVs. For instance, the public process leading up to this planning document identified potential legislative protections including WSR designation, establishment of a National Conservation Area, and/or wilderness designation. These designations, or some combination of such, could provide sufficient or even superior protection of the ORVs identified. The DRD, a local collaborative effort addressing the management concerns and needs for the Dolores River, has long been working through the values to be protected and some of the options for achieving needed protection.

Many comments were received on the Draft EIS analysis of this river segment. Comments ranged from providing additional protections to recognizing the numerous potential conflicts with private rights and development opportunities. A prominent theme was to consider carefully the work of the DRD and related efforts. The Draft EIS and LRMP revision recognized the progress of the DRD process. Although the DRD process continues, and appears to have made great progress in gathering information and ideas for future river management, few specific actions have been implemented to achieve enduring protections for this stream reach.

Through the Draft EIS, public input was sought specifically on how the results of collaborative efforts such as the DRD should be considered as the BLM and USFS address the Section 5(d) requirements of the WSRA in the LRMP revision. Comments received on the Draft EIS generally encouraged the agencies to

find ways to support the work of these community-based groups and to make use of the scientific information stemming from these efforts. Some comments also asked that the finding of suitability be delayed to provide additional time for the DRD to complete its process. A delay does not appear to be warranted given the analysis above and agency guidance encouraging the completion of suitability determinations through the land use planning process. However, it is important to note that the DRD and related group processes continue, including serious discussion of legislative or other actions that could achieve protections similar, and possibly much broader, than those offered by WSR designation.

#### Rio Lado

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from its confluence with the Dolores River upstream for 2.83 miles. Even though this is not a third-order or larger stream, all streams occupied by high-purity Colorado River cutthroat (*Oncorhynchus clarkii pleuriticus*) were analyzed. Rio Lado was eligible because it is the best high-purity Colorado River cutthroat fishery on the SJNF in the Dolores River Geographic Management Unit (GMU) (see below). Since the initial finding of eligibility was presented in the Draft EIS, genetic research of the fish population has shown that the cutthroat trout inhabiting Rio Lado are actually greenback cutthroat (*O.c. stomias*), Colorado's State fish and a threatened species under the Endangered Species Act.

The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a scenic classification. This classification was chosen because the stream is accessible by a four-wheel-drive road at the headwaters, but does not have readily available access to the stream. There is also a trail along the river.

**Land Ownership:** Land ownership is split between NFS and private land. Table D12 is a breakdown of the ownership along the river, in miles.

Table D.12: Miles by Land Ownership

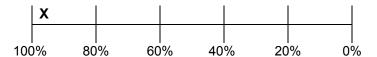
NFS	Private	Total	% NFS
2.80	0.03	2.83	99.1%

Table D.13 is a breakdown of the ownership within the river corridor in acres.

Table D.13: Acres by Land Ownership

NFS	Private	Total	% NFS
947.84	8.60	956.44	99.1%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Fish:** The Rio Lado contains a population of high-purity greenback cutthroat trout. The greenback cutthroat trout is a threatened species under the protection of the Endangered Species Act.

#### **Existing and Potential Land Uses**

NFS land at the Rio Lado would be managed as a natural landscape with limited management. The upper tip of the corridor is within an area of active management, but timber harvest is not expected because the terrain is not suitable for timber. The allotment management plan prohibits livestock grazing within the

stream corridor. According to the Montezuma County Land Use Plan for the Unincorporated Areas of Montezuma County (Montezuma County 1997), the small amount of private land along the Rio Lado is classified as agricultural with a density of one dwelling per 30-acre parcel. This type of development would not interfere with the recreational classification of the river.

#### Potential for conflict with existing and potential land uses



#### **Mineral potential**

There is no favorable occurrence for locatable minerals, and there has been no production.

There is no oil or gas production and potential is low.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- The SWSI report shows no conditional water rights in this stream, and no potential reservoir sites.
   None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

The fish habitat improvement structure is a structural change at one point on the stream.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The river corridor along the Rio Lado contains 1.6 miles of trail and 1.7 miles of closed logging roads.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The Rio Lado gets light overall recreation use with the exception of heavy commercial horseback and hunting use of the trail paralleling the stream. The corridor has been closed to grazing, and the terrain is generally not conducive to timber harvest.

#### Potential for conflict with recreation and other resources



#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major economic base in Montezuma County is retirees (39%).

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and impacts of Wild and Scenic and Other Methods and Suitability Determination

The Rio Lado is not determined to be suitable as a Preferred Alternative in this analysis. The ORV of greenback cutthroat trout recognizes the potential importance of the Rio Lado in terms of contributing to the long-term conservation of the threatened greenback cutthroat. Although a relatively small stream and a segment of less than 3 miles in total length, the Rio Lado does present the species conservation benefits of relative isolation that can be key to maintaining genetic diversity and protecting populations from certain catastrophic events. This single ORV, however, can be protected sufficiently through the management of adjacent NFS lands and through the protection of instream flows through programs such as CWCB instream flow protection. This is possible because of the relatively few conflicts with stream protection and the fact that most of the conflicts fall within direct control of the USFS. In the LRMP revision, the Rio Lado falls within management areas that provide for adequate protection of the watershed. Protection of flows can be pursued through other methods.

Comments received on the Draft EIS included support for a determination of suitability because Colorado River cutthroat (since identified as greenback cutthroat) are an appropriate ORV and there are few conflicts. Other comments questioned whether the fish population is an ORV and cited potential conflicts with future county planning and development opportunities. In our review, we find that the cutthroat population is indeed an ORV, but WSR suitability is not the preferred approach for ensuring protection of the population.

## West Dolores River (and portions of tributaries Falls Creek and Eagle Creek)

**Location:** The stream was studied from its headwaters where it becomes a third-order stream in the Lizard Head wilderness to its confluence with the Dolores River. The 0.25-mile corridor on either side of the stream encompasses waterfalls on Falls Creek and Eagle Creek. The entire studied section was determined to be eligible. The total length of river studied and found eligible was 33.74 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

This stream was previously studied for inclusion in the National Wild and Scenic Rivers System. In 1976, the Colorado Department of Natural Resources recommended the West Dolores as a suitable river, even though the federal agencies did not concur. Though Congress never acted, the USFS has managed the NFS portions as a 10D management area ("Wild and Scenic River management area") to protect the ORVs.

**Wild and Scenic Classification:** The segment has a number of different eligibility classifications, which can be found in Table D.14 of stream miles by classification.

**Table D.14: Miles by Classification** 

Wild	Scenic	Recreational	Total
5.17	0.00	28.54	33.71

The segment in a recreation classification was chosen because a major gravel road follows the river until it reaches the wilderness boundary. From the wilderness boundary to the headwaters the segment is classified as wild since there is no road access.

**Land Ownership:** Land ownership is split between NFS, non-Federal, and private land. Table D.15 is a breakdown of the ownership along the West Dolores River, in miles

Table D.15: Miles by Ownership

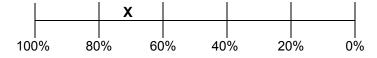
NFS	No	n-Federal	Private	Total	% NFS
17.78		1.51	14.42	33.71	52.7%

The following table is a breakdown of the ownership within the river corridor in acres.

Table D.16: Acres by Ownership

NFS	Non-Federal	Private	Total	% NFS
6,954.24	281.79	2,647.43	9,883.46	70.4%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Wildlife:** The West Dolores River contains a cluster of black swift (*Cypseloides niger*) nests. The nest sites are behind or adjacent to waterfalls on Navajo Falls and Falls Creek in the 0.25-mile corridor on either side of the West Dolores River.

The black swift builds nests only at waterfalls. The nests are made of moss and require mist from the waterfall to remain intact. The black swift worldwide breeding distribution is limited to a narrow portion of the Rocky Mountains from Mexico to British Columbia and a narrow band along sea cliffs overlooking the Pacific coast from California to Alaska. The SJNF planning area provides a significant contribution to the species' worldwide breeding distribution by providing a core breeding population and by providing critical connectivity within the southern Rocky Mountains portion of its range. Of the 10 streams studied on the SJNF that have black swift nest sites, three were chosen as outstandingly remarkable because they contained the best clusters of nests.

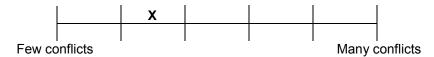
#### **Existing and Potential Land Uses**

The NFS land in the corridor of the West Dolores would be managed as a recreation-emphasis area along Road 535 and as an area where natural processes dominate in and adjacent to the Lizard Head wilderness. This is compatible with the black swift ORVs

According to the Montezuma County Land Use Plan for the Unincorporated Areas of Montezuma County (Montezuma County 1997) the private land along the West Dolores River in Montezuma County is classified as agricultural with a density of one dwelling per 30-acre parcel. This type of development

would not interfere with the recreational classification of the river. The rest of the private land is in Dolores County. The Dolores County Master Plan (Dolores County 1997) does not classify the land within the county; therefore, the building density is unknown in this area.

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

The area near Dunton has been mined for silver and gold since the late 1800s. There is no current production. The area near Dunton is favorable for polymetallic replacement and skarn deposits. It is favorable for epithermal veins in the Lizard Head wilderness.

There is no oil or gas production and potential is low.

#### Potential for conflict with minerals



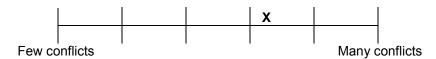
#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 28 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 31.421 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 0.9 cfs.
- The SWSI report shows one conditional water right on a tributary to this stream. The CWCB has
  also mapped three potential reservoir sites, but these have not been verified for feasibility. None
  of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this
  river.

There are occasional headgates and low dams associated with the water diversions. In addition, short sections of riprap protect Road 535 from erosion on the outside of some bends on the river. Additional riprap may be present on private land to protect fields from erosion on the outside of bends. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The West Dolores River corridor contains 24.9 miles of road running up the valley, which is maintained for passenger cars. There is an additional 3.2 miles of road maintained for passenger cars in campgrounds and roads leading out of the corridor on NFS land. There is also 1 mile of four-wheel-drive road leading out of the corridor and additional roads on private land.

USFS facilities within the corridor are the Navajo Lake Trailhead, Burro Bridge Campground, Dunton Guard Station, Geyser Trailhead, Johnny Bull Trailhead, Willow Divide Trailhead, Mavreeso Campground, Goble Trailhead, West Dolores Campground, and Lower Stoner Trailhead.

There are also 4.7 miles of the Navajo Lake Trail within the corridor and 4.1 miles from eight other trails leading out of the corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

Recreation in the area includes camping, both within developed campgrounds and at dispersed sites, hiking, mountain biking, hunting, horseback riding, and fishing.

Other activities that may occur in the area include agriculture, livestock grazing, and mining.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

The headwaters and the first 5 miles of the river are in the Lizard Head wilderness.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major economic base in Dolores County is agribusiness (33%) based on agricultural production in the area. This affects the West Dolores River, which is diverted for irrigation.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The West Dolores River was not determined to be suitable for WSRA designation under the Preferred Alternative. The ORVs present on the upper reaches of the West Dolores would be protected sufficiently through land use plan management direction, existing wilderness designation, and existing instream flow protections. The West Dolores River was previously studied for WSR suitability and was found by the Colorado Department of Natural Resources to be suitable, although the USFS did not concur.

The West Dolores River contains one identified ORV related to the occurrence of active black swift nests. Black swifts are a relatively rare species with highly specialized nesting requirements. The SJNF contains a large portion of the active nests in Colorado and the headwaters of the West Dolores contain particularly high concentrations of black swift nests. The values associated with these nest clusters on the West Dolores are indeed remarkable, but they are limited to the uppermost reaches of the stream and its

tributaries. There are essentially no conflicts with protection of this ORV in the upper reaches of the West Dolores. The ORV is located within or adjacent to the Lizard Head wilderness area and would be adequately protected by either wilderness designation, the management proposed under the LRMP that natural processes would be allowed to dominate, or the CWCB instream flows that exist for this stream and tributary.

By contrast, lower portions of the river do not contain identified ORVs and do present numerous conflicts with river protection. In particular, concentrations of private land and associated development near and along the river, numerous water diversions, foreseeable future water diversions and reservoir sites, and transportation facilities in the river corridor, would combine to make it difficult to protect many river values. Because of the absence of identified ORVs in the lower portion of the river, alternative protections have not been considered.

Comments received on the Draft EIS were generally supportive of the findings presented in the draft and carried forward above.

#### **Summit Canyon**

**Location:** The stream was studied from the Colorado state line to its confluence with the Dolores River, and the entire stream was found eligible. The total length of river studied and found eligible is 12.15 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs

**Wild and Scenic Classification:** This entire segment has a scenic classification. This classification was chosen because there is a four-wheel-drive road that runs along the top of the canyon. The river is accessible in some locations but not readily accessible by road.

**Land Ownership:** Land ownership is split between BLM and private land. Table D.17 is a breakdown of land ownership along this segment in miles.

Table D.17: Miles by Ownership

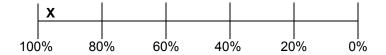
BLM	Private	Total	% Federal (BLM)
11.76	0.39	12.15	99.1%

Table D.18 is a breakdown of the ownership within the river corridor in acres.

Table D.18: Acres by Ownership

BLM	Private	Total	% Federal (BLM)
3,563.03	85.48	3,648.51	97.7%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Wildlife:** Summit Canyon is one of three canyons on the TRFO that contains canyon tree frogs. Canyon tree frogs have a state ecological rating of 2, meaning that they are rare or imperiled within the state. The species is also listed as a BLM Colorado Sensitive Species. The tree frog was previously identified as a state species of concern, but is now identified as "effectively conserved" in the Colorado Natural Heritage Programs Scorecard presented in the State of Colorado's Biodiversity (Colorado Natural Heritage Program 2011). The canyon tree frog is river-related because the species occur along streams in deep rocky canyons. Tree frogs are most active at night but are frequently found during the day resting in small

depressions in solid rock near pools of water. They breed in canyon bottom pools often bounded by solid rock.

# **Existing and Potential Land Uses**

The lower half of Summit Canyon would be managed as a natural landscape with limited management. The upper half would have active resource management, such as grazing and mineral leasing. Protection of the wildlife ORV in the active management area may require some compromises.

The small amount of private land is classified for natural resources, agriculture and recreation in the San Miguel County Comprehensive Development Plan (San Miguel County 2001). These uses would not interfere with the scenic classification.

# Potential for conflict with existing and potential land uses



#### **Mineral Potential**

The area has numerous uranium mines. The Slickrock uranium district encompasses the Dolores River, Summit Canyon, and McIntyre Canyon as they pass through most of San Miguel County, giving them high potential for uranium. There is active uranium leasing in the vicinity of this stream.

The oil and gas potential is high.

#### Potential for conflict with minerals

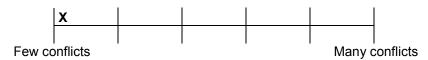


#### Water Resources Development.

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights or reservoir sites in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

# Potential for conflict with water resources development



#### **Transportation and Facilities**

There are 10.6 miles of primitive, four-wheel-drive or local roads likely not maintained for passenger cars, as well as 0.4 mile of road maintained for passenger cars. In addition there are 5.7 miles of ATV trails within the river corridor.

#### Potential for conflict with transportation and facilities

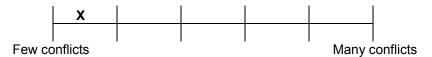


#### **Recreation and Other Resource Activities**

The main recreational activity in the area is hiking, as well as use of the road and trails by ATVs.

Other activities that may occur in the area include agriculture, livestock grazing, and mineral development.

#### Potential for conflict with recreation and other resources



#### Socioeconomic Environment

According to the San Miguel County Comprehensive Development Plan (San Miguel County 2001), San Miguel County is a diverse county that consists of 1,287 square miles. The east end of the county is driven by the upscale resort economy of the Telluride area, while the west end of the county, which is where Summit Canyon is located, is filled with wide-open spaces and an old-time western ranching lifestyle. The economic base in this area is dominated by agriculture.

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Summit Canyon was not determined to be suitable for WSR designation in the Preferred Alternative. This is a change from the Draft EIS preliminary finding of suitability. The Summit Canyon ORV presented in the Draft EIS was limited to the presence of canyon tree frogs. The canyon tree frog continues to be given a NatureServe ranking of G5/S2, globally secure but imperiled within the state of Colorado, but is identified as "effectively conserved" in the Colorado Natural Heritage Programs Scorecard presented in the State of Colorado's Biodiversity (2011) and is represented within multiple BLM-protected areas in the state. Comments received on the Draft EIS raised the concern of whether the tree frog should constitute an ORV given that occurs in multiple locations in western Colorado and is considered stable range-wide. Comments also suggested the tree frog would not receive effective protection via WSR designation given the ephemeral nature of the stream and the potential impact of upland activities in the watershed. In addition, comments pointed to the activities of the DRD that may ultimately provide broader protections for Summit Canyon. After reviewing comments on the Draft EIS and considering further the global and state ranking of the species, it has been determined that a finding of WSR suitability would not constitute the most effective means of protecting the tree frog habitat in Summit Canyon.

The canyon tree frog remains a BLM sensitive species and, as such, would receive adequate attention through other actions presented in the LRMP, as well as management prescriptions applied to future activities within the canyon and its watershed. Efforts of the DRD may provide even greater security for this ORV despite removing the determination of suitability.

# McIntyre Canyon

**Location:** The stream was studied from where it becomes a third-order stream to its confluence with the Dolores River and the entire stream was found eligible. The total length of river studied and found eligible is 5.77 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs. We believe that it is an intermittent stream that flows fairly predictably for a short time in the spring.

**Wild and Scenic Classification:** This entire segment has a scenic classification. This classification was chosen because there are both gravel and four-wheel-drive roads that run along the canyon and it is accessible in some locations, but not readily accessible by road.

**Land Ownership:** Land ownership is split between BLM and private land. Table D.19 is a breakdown of land ownership along this segment, in miles.

Table D.19: Miles by Ownership

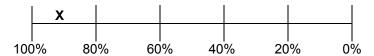
BLM	Private	Total	% Federal (BLM)
5.01	0.81	5.82	86.2%

Table D.20 is a breakdown of the ownership within the river corridor (0.25 mile on either side of the stream) in acres.

Table D.20: Acres by Ownership

BLM	Private Total		% Federal (BLM)	
1,569.00	98.72	1,667.73	94.1%	

# Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

**Ecology:** McIntyre Canyon is one of the few areas within the planning area that contains Eastwood's monkeyflower. It is extremely rare or imperiled within the state and rare globally (G3G4/S1, Colorado Natural Heritage Program). McIntyre Canyon has unique hanging gardens with rare Eastwood's monkeyflower. The Colorado Natural Heritage Program ranks the hanging garden community including Eastwood's monkeyflower as G2G3/S2S3 The combination of the stream-carved canyon and seeping groundwater coming to the surface on the canyon wall provides the unique habitat required by Eastwood's monkeyflower.

# **Existing and Potential Land Uses**

Management prescriptions stemming from this plan generally provide for managing the McIntyre Canyon area as a natural landscape. This is compatible with protection of the ecology ORV.

The small amount of private land is classified for natural resources, agriculture, and recreation in the San Miguel County Comprehensive Development Plan (San Miguel County 2001). These uses would not interfere with the scenic classification.

# Potential for conflict with existing and potential land uses



#### **Mineral Potential**

The Slickrock uranium district encompasses the Dolores River, Summit Canyon, and McIntyre Canyon as they pass through most of San Miguel County, giving them high potential for uranium. There is active uranium leasing in the vicinity of this stream.

The oil and gas potential is high.

#### Potential for conflict with minerals



# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights or potential reservoir sites in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

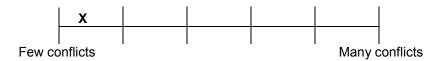
# Potential for conflict with water resources development



#### **Transportation and Facilities**

There are 4.1 miles of primitive four-wheel-drive road, which are not maintained for passenger cars, as well as 0.2 mile of ATV trail within the river corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The main recreational activity in the area is hiking from the Dolores Canyon, as well as use of the road and trails by ATVs.

Other activities that may occur in the area include agriculture, livestock grazing, and mineral development.

#### Potential for conflict with recreation and other resources



# Socioeconomic Environment

According to the San Miguel County Comprehensive Development Plan (2001), San Miguel County is a diverse county that consists of 1,287 square miles. The east end of the county is driven by the upscale resort economy of the Telluride area, while the west end of the county, which is where McIntyre Canyon is located, is filled with wide-open spaces and an old-time western ranching lifestyle. The economic base in this area is dominated by agriculture.

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

McIntyre Canyon is found not to be suitable. The ORV of monkeyflower does represent a very significant concern that deserves protection, but McIntyre Canyon falls within an area of active uranium leasing and high oil and gas potential, posing some significant conflicts with river protection. Most of the lower reach of McIntyre Canyon would be protected from adverse impacts of fluid mineral development by No Surface Occupancy stipulations under the Preferred Alternative. Part of the canyon would also receive protection through a Controlled Surface Use stipulation. As with Summit Canyon, there is potential to mitigate the effects of other uses, but the ORV is more easily impacted by adjacent land use, especially those in the upper reaches, than the fairly limited habitats of the canyon tree frog. Coyote Wash, discussed below, also contains monkeyflower and another ORV and is at less risk of impact from adjacent land uses such as uranium mining and has been found suitable.

Comments received on the Draft EIS included suggestions to determine McIntyre Canyon as suitable for WSR designation to ensure a more holistic approach to managing the Lower Dolores River system. Other comments questioned whether ephemeral streams could be considered eligible and why hanging gardens should be an ORV. A broader view of the Lower Dolores River system is appropriate and is reflected in other plan prescriptions for the area. The DRD process has also been taking a holistic view of the system. Should future activities of the DRD lead to other forms of protection for the mainstem of the Dolores River, consideration could be given to extending protections to some or all of McIntyre Canyon. There are no specific requirements concerning the flow of an eligible river segment. Flows are sufficient if they sustain or complement the ORVs for which the segment would be designated. As such, intermittent and ephemeral streams can be eligible. The presence of hanging gardens including Eastwood's monkeyflower is determined to be an ORV due to its rare occurrence in the state as discussed above. While hanging gardens are often situated outside the main stream channel, they are closely associated with the stream and related water movement.

# Bull Canyon

**Location:** The stream was studied from its headwaters to its confluence with the Dolores River and the entire stream was found eligible. The total length of river studied and found eligible is 6.38 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

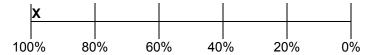
**Wild and Scenic Classification:** The lower section of the river to the confluence with the Dolores River is classified as wild since there is no development in this area and no easy access to this part of the river. The upper portion of the river contains many gravel roads leading into the river corridor, making it accessible in a few areas but not along the entire stream length.

**Land Ownership:** The entire segment is on land owned by the BLM (Table D.21). There are 1,880.77 acres of land within the corridor 0.25 mile on either side of Bull Canyon.

Table D.21: Miles by Ownership

Name	Wild	Scenic	Recreation	Total
Bull Canyon	1.44	4.94	0	6.38

# Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

**Recreation:** Portions of Bull Canyon are within a BLM WSA that offers outstanding recreation in an undeveloped setting. The pothole pools within this stream are a unique river-related feature, which draws rafters to hike from the Dolores to pools.

# **Existing and Potential Land Uses**

The lower portion of Bull Canyon is in the WSA and would be managed to retain its wilderness character. The majority of the Bull Canyon corridor is managed as a natural landscape with limited management. A small portion of the upper corridor is in the active management theme, where mineral leasing and other commodity production would be emphasized.

The ORVs are not in this upper portion, and it could be excluded without compromising the outstanding recreation opportunities.

#### Potential for conflict with existing and potential land uses

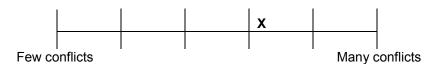


#### **Mineral Potential**

Bull Canyon is within the Uravan mineral belt, but outside the Slickrock uranium district, giving it moderate potential. There is active uranium leasing in the vicinity of this stream.

The oil and gas potential is high.

#### Potential for conflict with minerals



# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights or potential reservoir sites in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

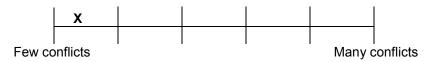
#### Potential for conflict with water resources development



# **Transportation and Facilities**

The river corridor contains 7.68 miles of local roads that are likely not maintained for passenger cars.

# Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

In addition to the hiking opportunity in the WSA, there is four-wheel-drive and ATV use on the roads.

Other activities that may occur in the area include agriculture, livestock grazing, and mineral development.

#### Potential for conflict with recreation and other resources



The potential conflicts are in the upper portion of the stream. If only the wild portion is considered for a WSR, the ORVs are substantially protected and the conflicts with other uses are greatly diminished.

#### Special Areas

The lower portion of Bull Canyon is in the WSA.

#### Socioeconomic Environment

The SJNF and TRFO did not conduct an economic study of Montrose County, so statistics comparable to those quoted for other counties are not readily available.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Bull Canyon was found not to be suitable in the Preferred Alternative. The recreation ORV recognizes the popularity of Bull Canyon with Dolores River floaters, and there are few conflicts with protection of the ORV. However, much of the portion of Bull Canyon containing the recreation ORV, and much of the larger Bull Canyon watershed, falls within the Dolores River Canyon WSA, ensuring protection of the recreation ORV and the free-flowing character of the stream until such time as Congress chooses to act on the designation of wilderness. This WSA was previously recommended to Congress for wilderness designation by the Secretary of the Interior and would be managed to protect wilderness values, including the recreational opportunities provided by Bull Canyon. The Bull Canyon watershed would receive further protection through a Controlled Surface Use oil and gas stipulation under the Preferred Alternative.

Comments received on the Draft EIS suggested Bull Canyon be found suitable to provide opportunity for a more holistic review of the Lower Dolores River system as discussed under McIntyre Canyon above. Other comments questioned whether the recreational value of Bull Canyon justified the ORV.

Once again, should the DRD lead to other forms of protection for the mainstem of the Dolores River, consideration could be given to extending protections to some or all of Bull Canyon.

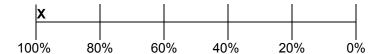
# Coyote Wash

**Location:** The stream was studied from its headwaters to its confluence with the Dolores River. Only the lower portion of the stream was found eligible. This segment begins where two unnamed drainages enter, at the boundary between Range 19 and 20 West. The total length of river studied was approximately 9.6 miles and the segment found eligible was 7.60 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a wild classification. This segment of the river contains no developed roads or trails, making it generally inaccessible.

**Land Ownership:** The entire stream segment is located on BLM land. There are 2,011.4 acres of land within the river corridor in Coyote Wash.

# Amount of federally owned land within the river corridor



## **Outstandingly Remarkable Values**

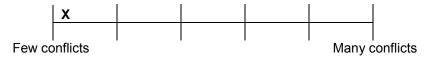
**Ecology:** Colorado's largest population of the Kachina daisy (*Erigeron kachinensis*) is located in Coyote Wash. It grows in horizontal crevices in seeping alcoves. This species is the most imperiled of all plants found in San Miguel and Montrose Counties and is ranked as G2/S1 by the Colorado Natural Heritage Program, as well as a BLM Colorado sensitive species. Eastwood's monkeyflower is also found in horizontal crevices on seeping canyon walls.

**Recreation:** Recreation is also an ORV. The flat sandy bottom of the wash, coupled with the vertical canyon walls, offers a hiking experience rarely duplicated in southwest Colorado. This attracts hikers from the camping areas in Colorado (Silvey's Pocket) and Utah, as well as significant use by rafters who camp at the mouth of Coyote Wash and hike upstream in Coyote Wash.

# **Existing and Potential Land Uses**

Coyote Wash is within a BLM WSA and would be managed to retain its wilderness characteristics. This is compatible with protection of the ecology ORV.

# Potential for conflict with existing and potential land uses

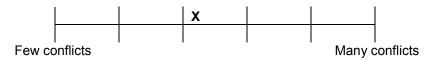


#### **Mineral Potential**

Coyote Wash is outside the Slickrock uranium district and outside the Uravan mineral belt, giving it low potential for uranium. There is active uranium- easing in the vicinity of this stream.

The oil and gas potential is high.

#### Potential for conflict with minerals



# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights or potential reservoir sites in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

# Potential for conflict with water resources development



#### **Transportation and Facilities**

There are no roads in the WSA.

# Potential for conflict with transportation and facilities

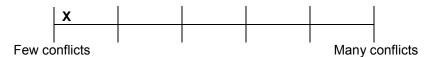


## **Recreation and Other Resource Activities**

Rafters on the Dolores hike up Coyote Wash, and campers in Silvey's Pocket outside the WSA find Coyote Wash an attractive hike to reach the Dolores River.

Other resource activities in the vicinity include uranium mining, oil and gas development, and livestock grazing.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

The entire segment is located within a WSA.

#### Socioeconomic Environment

The SJNF and TRFO did not conduct an economic study of Montrose County, so statistics comparable to those quoted for other counties are not readily available.

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Coyote Wash is found suitable for WSR designation under the Preferred Alternative. Coyote Wash contains multiple ORVs that are very rare in Colorado and even in a broader context. There are few conflicts with protection of ORVs and WSA status minimizes the opportunities for future conflicts. Interim protection of wilderness values under WSA status does provide significant levels of protection to Coyote Wash. However, the WSA does not include a large portion of the Coyote Wash watershed and, as a result, does not provide the same level of protection for the free-flowing character of the streams that could be provided through WSR designation and the federal reserved water right that would accompany designation by Congress. The Controlled Surface Use stipulation applied to the upper reaches of the canyon under the Preferred Alternative would, however, provide some protection to some of the watershed. The very strong ORVs and the opportunity to protect multiple ORVs on one stream segment, in addition to protecting the free-flowing character of the stream, weigh heavily in favor of adding additional protections under the WSRA.

Comments on the Draft EIS questioned whether the proper area of consideration was used for the ORVs, suggesting that the identified ORVs would not be outstanding if viewed using a broader geographic area. Comments also questioned whether recent scientific data were used. In the case of the Kachina Daisy, the plant continues to be listed as globally imperiled and critically imperiled within Colorado, one of only two states where the plant is known to exist (Colorado Natural Heritage Program 2011). For recreational ORVs, Forest Service Handbook 1909.12, Chapter 80, provides the criteria: "Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation, camping, photography, hiking, fishing, hunting, and boating."

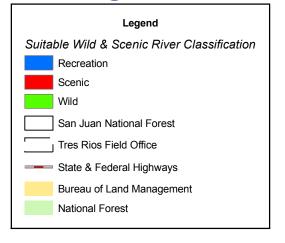
As stated above, it is important to note that the DRD process continues, including serious discussion of legislative or other actions that could achieve protections similar, and possibly much broader, than those offered by WSR designation for this stream segment.

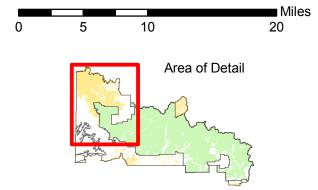
# Suitability Determination

Miles found suitable by classification are provided in Table D.22 and are illustrated on Figure D-1 Dolores River and Tributaries.

# Wild and Scenic Rivers Dolores River and Tributaries

San Juan National Forest and Tres Rios Field Office Figure D-1





The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

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MDR NAD 83, Polyconic Projection May 30, 2013

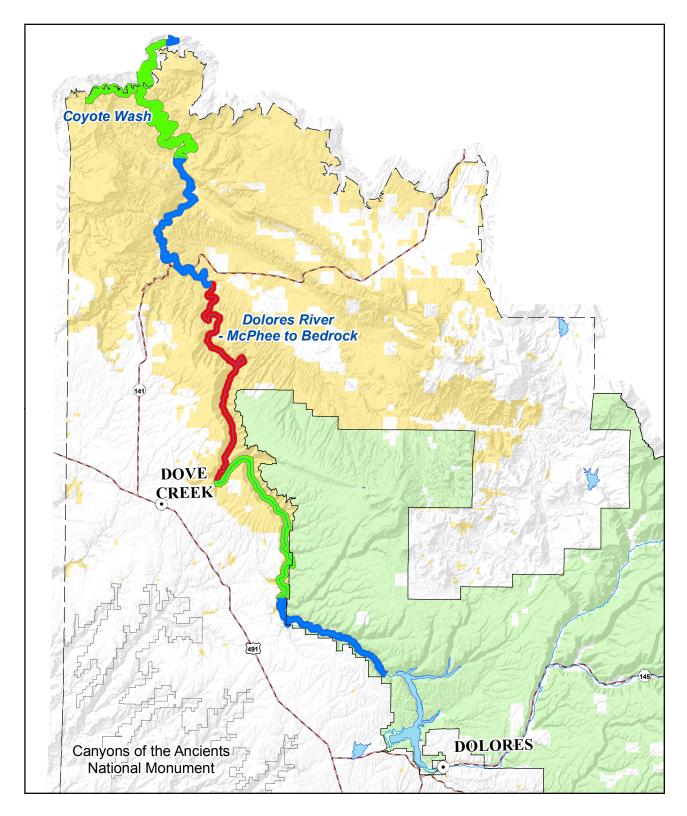


Table D.22: Miles found Suitable by Classification

River Segment Name	Wild	Scenic	Recreation	Total
Dolores above McPhee	0	0	0	0
Dolores River - McPhee To Bedrock	48.84	23.15	37.04	109.03
Rio Lado	0	0	0	0
West Dolores	0	0	0	0
McIntyre Canyon	0	0	0	0
Summit Canyon	0	12.15	0	12.15
Bull Canyon	0	0	0	0
Coyote Wash	7.60	0	0	7.60
Dolores Totals	56.44	35.30	37.04	128.78

# **Outstanding Issues and Conflicts to be Resolved**

The Southwest Basin Roundtable continues to prepare a needs assessment and identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

# **Animas River System**

Eligible portions of the Animas River and tributaries, and their classification, are as follows (Table D.23). Details for each segment are below.

**Table D.23: Eligible Portions** 

River Segment Name	Wild	Scenic	Recreation	Total
Animas River - Bakers Bridge to Silverton	0	0	30.77	30.77
Cement Creek	0	0	7.62	7.62
Cinnamon Creek	0	0	1.96	1.96
Maggie Gulch	0	0	4.62	4.62
Mineral Creek	0	0	8.65	8.65
South Fork Mineral Creek	0	0	7.41	7.41
California Gulch (West Fork Animas)	0	0	3.16	3.16
Animas River Totals	0	0	64.19	64.19

# Animas River – Bakers Bridge to Silverton

**Location:** The stream was studied from Animas Forks north of Silverton to Bakers Bridge, where the river leaves the narrow rocky canyon and enters the broad alluvial valley that is predominantly private land. The portion of the stream determined to have ORVs is from Silverton to Bakers Bridge and is 27.39 miles.

The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs. Although some portion of this and rivers in the other upper Animas watershed do not have water quality sufficient to support a fishery, the WSRA states that "rivers would not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with...state law". The total maximum daily loads adopted by the state incorporate the improvement plan. Water quality is currently sufficient for recreation, scenery, and cultural/historical ORVs.

**Wild and Scenic Classification:** This entire segment is classified as a recreational use. This classification was chosen because the Durango-Silverton Narrow Gauge Railroad follows the river along this entire segment.

**Land Ownership:** Land ownership is split between BLM, NFS, non-Federal, and private land. Table D.24 is a breakdown of the ownership along this segment, in miles

Table D.24: Miles by Ownership

BLM	NFS	Non- Federal	Private	Total	% NFS	% Federal (NFS+BLM)
1.29	22.44	0.03	7.02	30.78	72.9%	77.1%

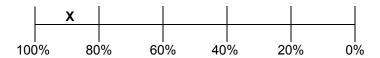
Table D.25 presents acres of land by ownership along the segment.

Table D.25: Acres by Ownership

BLM	NFS	Non- Federal	Private	Total	% NFS	% Federal (NFS+BLM)
678.75	7,147.43	20.18	894.18	8,740.54	81.8%	89.5%

The rights-of-way granted by the BLM for the Durango-Silverton Narrow Gauge Railroad follow the river within most of the corridor. These rights-of way encumber about 73 acres of BLM and 525 acres of NFS land listed in the above tables.

#### Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

Recreation and Scenery: The Durango-Silverton Narrow Gauge Railroad runs along the river throughout this entire segment. Visitors from all over the country and the world take the train each year to see the canyon and scenery associated with the river. The Durango-Silverton Narrow Gauge Railroad is a unique recreation opportunity in that it combines the historic aspects of the steam-powered train with the dramatic setting of the Animas River Canyon. It draws more than 200,000 visitors annually and is a primary economic engine for both Durango and Silverton during the summer months. This is a one-of-akind opportunity not duplicated by the Cumbres and Toltec Railroad or the diesel train that accesses the rim of the Grand Canyon.

Seventeen commercial outfitter and guide operators with USFS permits utilize the Upper Animas River corridor, including guided whitewater boating, fishing, hiking, backpacking, hunting, mountain climbing, and horse packing. Both private recreationists and commercial outfitters' clients are drawn to the Upper Animas from all over the United States and internationally due to the unique and rare opportunities the area offers. The free-flowing Upper Animas River provides the highest commercial whitewater put-in point elevation (over 9,300 feet) in Colorado. The Class V-rated (violent rapids, extremely difficult hazards) whitewater is also one of just a few rivers in Colorado that provides this type of extreme whitewater for commercial passengers. The Animas River has also been the site of numerous national competitive kayaking, rafting, and fishing events. Its listing on American Whitewater's national river inventory, while not sufficient by itself to be an ORV, supports the above analysis.

**Cultural/Historical:** The Animas River has historically served as a transportation corridor linking the hard rock mining community of Silverton to the larger communities of Animas City/Durango. The Animas Canyon wagon road was the first transportation route to connect Silverton to Animas City/Durango. The site has been determined eligible for the National Register of Historic Places. The road ran alongside the Animas River for much of its route. The Durango-Silverton Narrow Gauge Railroad, a designated National Historic Landmark, is a popular way to observe remote portions of the Animas River. Portions of the railroad in the Animas Canyon overlay the Animas Canyon wagon road. The town of Silverton, located on the Animas River, and the terminus of the railroad, are both a National Historic District and a National

Historic Landmark. The Tacoma power plant, a site listed on the National Register of Historic Places, and the associated residences are located on the banks of the Animas River. The power plant supplied electricity to Silverton and several milling operations in the vicinity of Silverton. Electricity from the power plant was supplied to Silverton via a transmission line that was located adjacent to the Animas River.

# **Existing and Potential Land Uses**

The majority of this corridor would be managed as a recreation-emphasis area that bisects the Weminuche wilderness. A small portion at the lower end would be managed as a natural landscape with limited management, and the upper terminus is within the Silverton special management area. This is compatible with the recreation, scenery, and cultural resource ORVs.

Approximately 3.3 miles of the stream channel, accounting for 754 acres of private land, are within La Plata County. The draft La Plata County Land Use Code (August 2006) classifies the majority of this land as large-lot residential. This classification allows low-density single-family uses. These areas are developed at relatively low densities and either sited on large lots, typically between 10 and 15 acres, or sited on smaller lots (3–10 acres) within a cluster development that achieves a transition between rural areas/densities and more exurban or suburban areas. There is another private parcel at Needleton that was not included in the La Plata County Land Use Plan; therefore, the classification is unknown for this small private parcel.

The remainder of the private land is within San Juan County. The Animas River from the San Juan County line to Silverton is located in the Scenic Preservation Overlay District of the San Juan County Zoning and Land Use Regulation. This district includes all sites located within 1,500 feet of the center line of the track of the Durango-Silverton Narrow Gauge Railroad. The intent of the Scenic Preservation Overlay District is to prevent development from adversely affecting the scenic and historic assets of the county to the greatest degree possible. Within the Scenic Preservation Overlay District, only activities that do not involve any construction or development of any sort, including disturbing of soil or trees (such as grazing, camping, picnicking, hiking, and outdoor recreation), would be permitted as uses by right. All other uses within this zone would be uses subject to review. Development within the Scenic Preservation District must be designed in a manner that protects the environmental and historical assets of the area. All site design and development must be done in a manner that minimizes impacts upon scenic views or vistas. Design plans must take into account characteristics of soils, slopes, and geological hazards in a manner intended to protect the health, safety, and welfare of users of the site and the scenic value of the site. Design of the site must include safe, convenient, and adequate arrangements for pedestrian circulation, roadways, driveways, off-road parking, and loading space. Additional setbacks, landscaping, screening, or design requirements may be required by the county in order to preserve the natural, pristing appearance of the area and to minimize the visual impact to viewsheds and view corridors.

This type of development would not interfere with the recreation classification of the river.

#### Potential for conflict with existing and potential land uses



#### Mineral Potential

The Animas River at the confluence of Needle Creek is just west of the Needle Mountains Mining District. There was active gold and silver exploration from 1881 to 1935 and molybdenum exploration in the 1970s. These activities were to the east of the Animas River corridor. There is no current production, and the area in the Weminuche wilderness has been withdrawn from mineral entry. There is favorable occurrence of minerals as polymetallic replacement and skarn deposits.

Approximately 5 to 6 miles south of Silverton there was prospecting for gold and silver near White Head Gulch and, in the 1980s, prospecting for uranium at Elk Park. There is no current production. Resource

occurrence is favorable in polymetallic epithermal veins near White Head Gulch and in epithermal uranium veins near Elk Park. These sites are just south of the highly mineralized area of the Silverton Caldera. With changes in the price of metals, mining activities could resume.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the USFS and/or BLM, or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

There is no potential for oil and gas.

#### Potential for conflict with minerals



# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 14 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 20.904 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 613.3 cfs
- 3. The CWCB has mapped two potential reservoir sites in the reach, and one above the reach, but these have not been verified for feasibility. Several of the projects listed in SWSI Section 6 (Identified Projects and Processes) are likely related to the conditional water rights listed by the Colorado Division of Water Resources.

The volume of water needed for future uses near Silverton, as identified by the conditional water rights applications filed by both private and public entities, is a very small volume relative to the entire volume of water that flows in the river. The larger conditional water rights within and upstream of this segment are for proposed reservoirs. If these reservoirs were to be constructed, they would provide flatwater recreation opportunities in the Silverton area, but most of the consumptive use of the stored water would occur at downstream locations near Durango. It is unlikely that the aggregate amount of conditional water rights converted to absolute uses would be large enough to have any significant impact on the flows needed to support ORVs.

There are occasional headgates associated with existing diversions. In addition, short sections of riprap protect the tracks of the Durango-Silverton Narrow Gauge Train from erosion on the outside of some bends on the river. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### Transportation and Facilities

There are no roads within the river corridor; however, the railway follows the entire length of the segment. There are also 8.5 miles of trail within the river corridor.

There are train water tank facilities and railroad spurs at several locations along the corridor and plans for some additional development. The Tacoma power plant is also located within the segment, while the town of Silverton is above the upper end of this stream segment.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

There are many recreation opportunities along the Animas River. These include riding the Durango-Silverton Narrow Gauge Train, whitewater rafting, kayaking, fishing, hiking, backpacking, hunting, skiing, and horse packing. A private tourist resort located on private land in the Animas Canyon approximately 2.5 miles north of Tacoma is accessible only by the railroad or helicopter.

Other activities that may occur in the river corridor include agriculture and mining.

#### Potential for conflict with recreation and other resources



# Special Areas

Much of the stream segment is surrounded by the Weminuche wilderness on both sides of the river. The San Juan Scenic Byway is within the corridor for a short section at the lower end of the stream.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the economic base in both La Plata and San Juan Counties is tourism. Thirty-four percent of the economy comes from tourism in La Plata County, while 58% of the economy is based in tourism in San Juan County. Along the lower part of the river in La Plata County the tourist industry is mainly resorts, while in San Juan County around Silverton the tourist industries are second homes and tourist services. The train is a major draw for many of the tourists in both counties. The second highest segment of the economic base is funds coming in to retirees.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The Animas River between Bakers Bridge and the boundary of public and private land just below Silverton is found to be suitable under the Preferred Alternative. The portion of the Animas from the public land boundary to Silverton (approximately 3.6 miles) is not found suitable due to potential conflicts with private land and future development of the river corridor. The ORVs for the Animas River are substantial and are very closely tied to community and regional identity in the area. The Animas River corridor and the closely associated narrow gauge railroad represent the historical and modern-day economic engines of the region. The river is renowned for its scenic character and is a very popular recreational attraction.

Comments on the Draft EIS covered a wide spectrum of concerns and expressed both strong support and opposition to finding the Animas River suitable for WSR designation. Concerns were raised regarding potential impacts to the continued operation of the train. Given that the scenic and historic railway itself is identified as an ORV, a finding of suitability would support continued train operations and maintenance, and the related economic activity that itself presents a way to enjoy the ORVs and preserve the historical character.

Other comments raised concerns that a finding of suitable would impede future water developments and mining within the reach. USFS guidance (Forest Service Handbook 1909.12 Chapter 80) states that proposed water developments "would be analyzed as to their effect on a river's free-flow, water quality, and outstandingly remarkable values, with adverse effects prevented to the extent of existing agency authorities." In some cases, the results of this analysis could lead to a decision to prevent certain new developments and could result in requiring mitigation measures for other developments. It should be noted that determining a river to be suitable does not create a water right, although designation of a WSR by Congress or the Secretary of the Interior would establish a federal reserved water right.

Forest Service Handbook 1909.12 provides guidelines for managing mineral development activities. For locatable minerals such as gold, silver, or rare earths, the handbook states that activities "shall be conducted in a manner that minimizes surface disturbance, sedimentation and pollution, and visual impairment." Agency policy does not necessarily prohibit mineral development along suitable reaches but some proposed activities could be limited or prohibited, subject to valid existing rights, if necessary to protect the free-flowing nature of the stream and the identified ORVs.

Other comments questioned whether the presence of the train should be viewed as a positive ORV and whether the described whitewater recreation should constitute an ORV.

The remote character of the Animas River throughout much of this reach contributes to few conflicts with the protection of the river under the WSRA. WSR suitability for this reach of the Animas River was determined to be the best method of protecting the river segment's values because 1) there are few points of diversion within this reach and nearly all sizable water needs fall below this reach, allowing the suitable portion of the river to serve as the conduit for transporting water needed downstream; 2) there are no state instream flows currently in place and the state instream flow process typically has not based protections on recreation, scenery, cultural, or historical values; 3) the ORVs of recreation, scenery, cultural, and historic values typically do not require preservation of all of the current flows in a river segment through a federal reserved right and need not present direct conflicts with existing water uses within or upstream of the study segment; 4) the adjacent Weminuche wilderness, including potential expansions of the wilderness, would add protection to the upland portions of the watershed but would not directly protect much of the stream corridor for this segment; 5) a WSR designation would largely support the recreation and tourism activities focused within the river corridor and could provide further opportunities for the marketing of these activities that greatly benefit the local economy; and (6) WSR designation of this segment of the Animas River could prove valuable in obtaining the necessary resources and support for ongoing water quality improvement and abandoned mine land reclamation efforts in the upper reaches of the Animas River and its tributaries that would ultimately benefit downstream uses as well. (Please refer to Abandoned Mines and Hazardous Materials sections of the LRMP for a discussion of abandoned mine land reclamation and the work of the Animas River Stakeholders Group.)

A community-based effort titled the Animas River Workgroup was formed in June 2011 to consider potential river protections and alternatives to WSR designation. At the time of writing this analysis, the workgroup has not yet finished their review nor published a report. When the Animas River Workgroup publishes a summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

## **Cement Creek**

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with the Animas River and the entire stream was found

eligible. The total length of river found eligible was 7.62 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs. The water quality of Cement Creek and the connected seeps is similar, and both are of a quality that nurtures the iron fen plants.

**Wild and Scenic Classification:** This entire segment has a recreation classification. This classification was chosen because there is an improved gravel road that closely follows the stream from the confluence to the forks. This road then becomes a four-wheel-drive road to the headwaters.

**Land Ownership:** Land ownership is split between BLM and private land. Table D.26 is a breakdown of land ownership along this segment.

Table D.26: Miles by Ownership

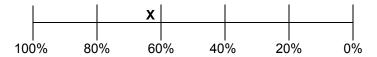
BLM	Private	Total	% Federal (BLM)	
4.83	2.79	7.62	63.4%	

Table D.27 is a breakdown of the ownership within the river corridor in acres.

Table D.27: Acres by Ownership

~	<i>J</i> •			
	BLM	Private	Total	% Federal (BLM)
	1,518.46	872.93	2,391.39	63.5%

# Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

Cement Creek is one of the few areas in the world with iron fens. Iron fens have state and global ecological ratings of 2, meaning that they are rare or imperiled within the state and worldwide. Currently there are only 13 iron fens known globally, four of which occur in San Juan County. The Cement Creek iron fens occupy the valley bottom and are fed by groundwater seeping from eastern and western valley walls, as well as overflow from Cement Creek. As such, Cement Creek is a Colorado Natural Heritage Program potential conservation area.

#### **Existing and Potential Land Uses**

The BLM land in the corridor would be managed as a recreation-emphasis area, with a small portion in the Silverton Mountain ski area. Protection and interpretation of the ecology ORV can be accomplished within this management framework.

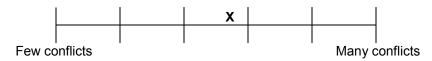
Cement Creek is located mostly in the Mountain Zoning District of the San Juan County Zoning and Land Use Regulation. The intent of the Mountain Zoning District is to preserve the natural environment of the mountains of San Juan County while allowing activities normally occurring in the mountains of San Juan County. Within the Mountain Zone, only mining and milling, and activities that do not involve any construction or development of any sort (such as grazing, camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. All other uses within the Mountain Zoning District would be uses subject to review. The minimum parcel or lot area would be 5 acres. The minimum setback would be 50 feet from the property line.

A small section of Cement Creek is in the Rural Residential District where it runs near Silverton. The intent of the Rural Residential Zoning District is to maintain a low-density residential use of larger tracts with individual sewer and water services. Within the Rural Residential Zone, only activities that do not

involve any construction or development of any sort (such as camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. Other activities including single-family dwellings, multiple-family dwellings, and commercial businesses would be permitted within this zone as uses subject to review. Industrial uses, including mining, milling, and manufacturing, would not be permitted in this zone unless approved as a conditional use. The minimum parcel or lot area would be 5 acres. The minimum setback would be 50 feet from the property line.

These types of development would not interfere with the recreation classification of the river.

## Potential for conflict with existing and potential land uses



#### **Mineral Potential**

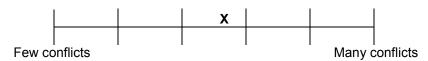
Cement Creek is the site of numerous exploration and production activities, beginning in the 1870s. Production in this vicinity ceased in 1991, though small-scale exploration continues. The area is favorable for polymetallic alteration within the Silverton Caldera.

With changes in the price of metals, mining activities could resume.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the agency, or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

There is no oil and gas potential.

#### Potential for conflict with minerals

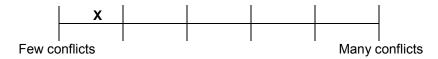


# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists five diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 0.016 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 1.19 cfs.
- 3. The SWSI report shows three conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river. Short sections of riprap protect County Road 110 from erosion on the outside of some bends on the stream, and at stream crossings. Additional riprap is present on private land at road crossings and to protect mining and milling operations from stream erosion. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development

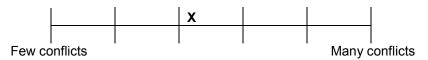


# **Transportation and Facilities**

County Road 110 is a gravel road that is located within the river corridor for 6.9 miles. There are also 4.8 miles of native surface road, which are not maintained for passenger cars, and include numerous bridges on private land.

The Silverton Mountain ski area development is located on private land, while the some of the ski runs are located on BLM land. There is also a power line in the corridor up to the mining facility at Gladstone.

Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The Silverton Mountain ski area is located along the creek. The road along the stream is also driven for the scenery in the area. Private lands in the corridor are being developed for recreation and/or summer homes, and for mining.

Other activities that may occur in the river corridor include sheep grazing in the alpine areas and mining.

#### Potential for conflict with recreation and other resources



# **Special Areas**

Cement Creek is a Colorado Natural Heritage Program potential conservation area. Cement Creek is part of the Silverton SRMA for high-alpine four-wheel-drive and scenic touring activities.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming into retirees. The tourist services are related to the use of the area around Cement Creek and Silverton Mountain ski area due to the proximity to Silverton.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County

## **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Cement Creek was found to be not suitable in the Preferred Alternative. The iron fens of Cement Creek are rare or imperiled and deserve additional protections, but there are a number of conflicts with the successful protection of Cement Creek that preclude further consideration for WSR status. In particular,

the location of the county road, the amount of private land involved, future additional development of Silverton Mountain ski area, and the potential for additional mining and/or mined land reclamation present major obstacles to protection. Comments received on the Draft EIS also pointed to potential conflicts with the county development corridor and water rights along Cement Creek. Other options for protection could include ACEC designation but such a designation would be hampered by the same conflicts identified above. The TRFO would continue to work with San Juan County, the Animas Rivers Stakeholder Group, and others to identify approaches for preserving the iron fens along Cement Creek. Cement Creek has been discussed by the Animas River Workgroup.

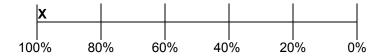
#### Cinnamon Creek

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with the Animas River and the entire stream was found eligible. The total length of river studied and found eligible was 1.96 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a recreation classification. This classification was chosen because the stream has a four-wheel-drive road the length of the valley leading to Cinnamon Pass, an important link in the Alpine Loop.

**Land Ownership:** The entire segment is within land owned by the BLM. There are 544.33 acres of land within the river corridor.

# Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

**Recreation:** Cinnamon Creek is along the Alpine Loop road system, a high country four-wheel-drive and heritage tourism opportunity that draws people from throughout the country. There are 17 commercial four-wheel-drive touring operators that utilize the Alpine Loop with permits from the BLM and USFS. People are drawn to the valley between the high peaks. The road parallels the stream, offering views of the lush riparian area in the foreground.

**Ecology:** Colorado Natural Heritage Program has also identified an excellent specimen of the altai cottongrass (*Eriophorum altaicum* var. *neogaeum*) and thickleaf whitlowgrass (*Draba crassa*) communities unique to the alpine tundra within the corridor. Both species have a state ecological rating of 3, meaning that they are vulnerable within the state. Cinnamon Pass is a Colorado Natural Heritage Program potential conservation area. The altai cottongrass and thickleaf whitlowgrass communities also extend beyond the streamside corridor.

# **Existing and Potential Land Uses**

The Cinnamon Creek corridor is within the Silverton special management area, emphasizing mining heritage and motorized roads in the alpine. This is compatible with the recreation classification and the protection and interpretation of the alpine ecosystem ORV.

Cinnamon Creek is located in the Mountain Zoning District of the San Juan County Zoning and Land Use Regulation. The intent of the Mountain Zoning District is to preserve the natural environment of the mountains of San Juan County while allowing activities normally occurring there. Within the Mountain Zone, only mining and milling, and activities that do not involve any construction or development of any sort (such as grazing, camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. All other uses within the Mountain Zone would be uses subject to review. The minimum parcel or lot

area would be 5 acres. The minimum setback would be 50 feet from the property line. This type of development would not interfere with the recreation classification of the river.

# Potential for conflict with existing and potential land uses



#### **Mineral Potential**

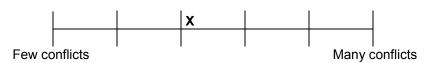
Cinnamon Creek has had exploration activities beginning in the 1870s, with most mines shutting down in the 1920s. There is no current production. The area is favorable for polymetallic alteration within the Silverton Caldera.

With changes in the price of metals, mining activities could resume.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the agency, or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

There is no oil and gas potential

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

Development of mineral resources may require the development of water resources.

There are no dams or riprap that impact the free-flowing character of this stream.

#### Potential for conflict with water resources development



# **Transportation and Facilities**

There are 2 miles of native surface road that are not maintained for passenger cars along the river corridor. This is part of the Alpine Loop Scenic Byway.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The Alpine Loop follows Cinnamon Creek, which is used by four-wheel-drive touring operators and the general public.

#### Potential for conflict with recreation and other resources



Other activities that may occur in the river corridor include sheep grazing and mining.

#### **Special Areas**

The Alpine Loop runs along the length of the stream. This area is also a potential Colorado Natural Heritage Program potential conservation area.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming in to retirees. The tourist services are related to the use of the area along Cinnamon Creek. There are a number of four-wheel-drive touring operators that drive the Alpine Loop Scenic Byway.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Cinnamon Creek is not found suitable under the Preferred Alternative. The ORVs of Cinnamon Creek are fairly modest when compared to other streams of the planning unit. There are relatively few conflicts facing the protection of the altai cottongrass and thickleaf whitlowgrass communities, which are only partially associated with the stream itself and the recreational ORV is protected by the designation of backcountry byway and incorporation into the Silverton special management area. Management under these protections should ensure adequate protection of the ORVs.

Comments on the Draft EIS pointed to concerns for wild and scenic suitability conflicts with mining activities and the presence of a county-maintained road along the stream.

# Maggie Gulch

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from its headwaters to its confluence with the Animas River and the entire stream was found eligible. The total length of river found eligible was 4.62 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a recreation classification. This classification was chosen because there is a four-wheel-drive road paralleling the river on the valley side wall, which then becomes a trail closely following the stream channel.

**Land Ownership:** Land ownership is split between BLM and private land. Table D.28 is a breakdown of land ownership along this segment, in miles.

Table D.28: Miles by Ownership

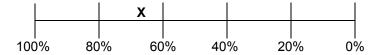
BLM	Private Total %		% Federal (BLM)
3.33	1.29	4.62	72.0%

Table D.29 is a breakdown of the ownership within the river corridor in acres.

Table D.29: Acres by Ownership

BLM	Private	Total	% Federal (BLM)	
988.79	506.11	1,494.90	66.1%	

#### Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

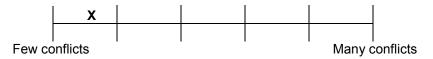
Maggie Gulch contains thickleaf whitlowgrass, Colorado Divide whitlowgrass (*Draba streptobrachia*), and showy whitlowgrass (D. *spectabilis var. spectabilis*), which all have state and global ecological ratings of 3, meaning they are vulnerable within the state and worldwide. Maggie Gulch is a Colorado Natural Heritage Program potential conservation area. It has also been identified by Colorado Natural Heritage Program as the site of altai cottongrass, which also has a state ecological rating of 3 and is vulnerable in the state. Many of these species grow in the streamside zone and in adjacent wet meadows. Thickleaf whitlowgrass grows in the drier rocky tundra at the head of the drainage.

# **Existing and Potential Land Uses**

The Maggie Gulch Corridor is within the Silverton special management area, emphasizing mining heritage and motorized roads in the alpine. This is compatible with the recreation classification and the protection and interpretation of alpine ecosystem ORV.

Maggie Gulch is located in the Mountain Zoning District of the San Juan County Zoning and Land Use Regulation. The intent of the Mountain Zoning District is to preserve the natural environment of the mountains of San Juan County while allowing activities normally occurring in these mountains. Within the Mountain Zoning District, only mining and milling, and activities that do not involve any construction or development of any sort (such as grazing, camping, picnicking, hiking, and outdoor recreation), would be permitted as uses by right. All other uses within the Mountain Zoning District would be uses subject to review. The minimum parcel or lot area would be 5 acres. The minimum setback would be 50 feet from the property line. This type of development would not interfere with the recreation classification of the river.

# Potential for conflict with existing and potential land uses



#### **Mineral Potential**

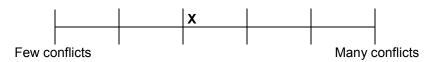
Maggie Gulch has had exploration and production activities, beginning in the 1870s, with most mines shutting down in the 1920s. Active mining occurred in this area as late as 1977, with ore being shipped to the mill at Howardsville and milled there at that time. There is no current production, though small-scale exploration continues. There is favorable occurrence of polymetallic alteration within the Silverton Caldera.

With changes in the price of metals, mining activities could resume.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the agencies or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

There is no oil and gas potential.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists one diversion in the corridor of this stream. The CWCB holds an instream flow water right on Maggie Gulch.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows one conditional water right (Cole Ranch) near this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There is little or no riprap in this stream. Development of mineral resources may require the development of additional water resources.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

There are 4.5 miles of native surface road that are not maintained for passenger cars at the lower end of the segment. County Road 110 approaches the lower end of Maggie Gulch for 0.3 mile and is maintained for passenger cars. The Continental Divide Trail is within the river corridor at the upper end of the segment for 1.7 miles.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The major recreational activity in this area is sightseeing and driving the four-wheel-drive road along the stream.

Other resource activities that may occur are mining and livestock grazing.

#### Potential for conflict with recreation and other resources



# **Special Areas**

Maggie Gulch is a Colorado Natural Heritage Program potential conservation area.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming in to retirees. The tourist services are related to the use of the area around Maggie Gulch due to its proximity to Silverton.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County.

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Maggie Gulch is not found suitable under the Preferred Alternative. The ORVs of Maggie Gulch are fairly modest when compared to other streams of the planning unit. There are relatively few conflicts facing the protection of the altai cottongrass, Colorado Divide whitlowgrass, showy whitlowgrass, and thickleaf whitlowgrass communities, which are only partially associated with the stream itself and are offered some protection by CWCB instream flows and being incorporated into the Silverton special management area.

There were no comments on the Draft EIS specific to Maggie Gulch suitability.

#### Mineral Creek

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with the Animas River and the entire stream was found eligible. The total length of river found eligible was 8.65 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a recreation classification. The San Juan Skyway Scenic Byway follows the stream along the entire segment.

**Land Ownership:** Land ownership is split between NFS, BLM, and private land. Table D.30 is a breakdown of land ownership along this segment.

Table D.30: Miles by Ownership

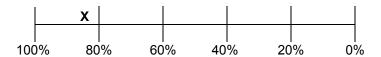
BLM	NFS	Private	Total	% NFS	% Federal (NFS+BLM)
0.20	7.07	1.39	8.66	81.7%	84.0%

Table D.31 is a breakdown of the ownership within the river corridor in acres.

Table D.31: Acres by Ownership

BLM	NFS	Non- Federal	Private	Total	% NFS	% Federal (NFS+BLM)
147.69	2,043.59	0.12	381.69	2,573.09	79.4%	85.2%

#### Amount of federally owned land within the river corridor



Mineral Creek is located mainly in the Scenic Preservation Overlay District of the San Juan County Zoning and Land Use Regulation. This district includes all sites located within 1,500 feet of the center line of U.S. Highway 550. The intent of the Scenic Preservation Overlay District is to prevent development from adversely affecting the scenic and historic assets of the county to the greatest degree possible. Within the Scenic Preservation Overlay District, only activities that do not involve any construction or development of any sort, including disturbing of soil or trees (such as grazing, camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. All other uses within this zone would be uses subject to review. Development within the Scenic Preservation Overlay District must be designed in a manner that protects the environmental and historical assets of the area. All site design and development must be done in a manner that minimizes impacts on scenic views or vistas. Design plans must take into account characteristics of soils, slopes, and geological hazards in a manner intended to protect the health, safety, and welfare of users of the site, and the scenic value of the site. Design of the site must include safe, convenient, and adequate arrangements for pedestrian circulation, roadways. driveways, off-road parking, and loading space. Additional setbacks, landscaping, screening, or design requirements may be required by the county in order to preserve the natural, pristine appearance of the area and to minimize the visual impact to viewsheds and view corridors.

Mineral Creek also has a small area in the Town/County Zone of Mutual Interest where it runs near Silverton. The intent of the Town/County Zone of Mutual Interest is to provide for cooperative approval and review of development and uses that might occur in that area of the county that is adjacent to the town of Silverton in which it is anticipated that town streets, water, sewer, and other public services might be extended, and which might be subject to annexation at some point in the future by the town. Any proposed development or use within this zone must be reviewed by both the Town of Silverton and San Juan County. The Town/County Zone of Mutual Interest identifies areas that, because of their proximity to the town of Silverton, are deemed to be subject to a commonality of interest by both the town and county in regards to future development. Any development that would occur along Mineral Creek would not interfere with the recreation classification of the river.

# **Outstandingly Remarkable Values**

**Recreation and scenery:** Mineral Creek is along the San Juan Skyway. This stretch of highway is designated as an All-American Road and a national scenic byway. The skyway attracts national and international visitors. Scenic values include wetlands containing unusual iron fens (bogs) and colorful geology from exposed mineral/ore deposits. Yellow to orange-brown deposits of sulfates, oxides, and hydroxides of iron cover the cobbles of the creek. Mineral Creek runs through a U-shaped glacial valley whose walls are marked by numerous snow avalanche runs. The aspen occupying avalanche chutes are able to survive. Mineral Creek is carved along ring fractures that outline the southwestern rim of the Silverton Caldera. The caldera process is also shown on the slopes of Anvil Mountain, which exhibit brilliant reddish and yellowish scree derived from the highly altered volcanic rocks.

**Ecology:** The Chattanooga iron fen, which borders Mineral Creek, has been identified by the Colorado Natural Heritage Program as a unique wetland site. It is home to a rare moss, Baltic sphagnum (*Sphagnum balticum*), that has not been found anywhere else in the continental United States. This wetland may qualify as a World Heritage Site. Iron fens have state and global ecological ratings of 2, meaning that they are rare or imperiled within the state and worldwide. Currently there are only 13 iron fens known globally, four of which occur in San Juan County. The Chattanooga iron fen is a Colorado Natural Heritage Program potential conservation area.

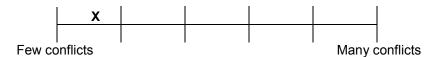
# **Existing and Potential Land Uses**

The Mineral Creek corridor would be managed with a recreation emphasis, largely because of the San Juan Skyway, with special areas at the fens managed for protection and interpretation of the ecology. This is compatible with the recreation classification and the recreation, scenery, and ecology ORVs.

Mineral Creek is located mainly in the Scenic Preservation Overlay District of the San Juan County Zoning and Land Use Regulation. This district includes all sites located within 1,500 feet of the center line of U.S. Highway 550. The intent of the Scenic Preservation Overlay District is to prevent development from adversely affecting the scenic and historic assets of the county to the greatest degree possible. Within the Scenic Preservation Overlay District, only activities that do not involve any construction or development of any sort, including disturbing of soil or trees (such as grazing, camping, picnicking, hiking, and outdoor recreation), would be permitted as uses by right. All other uses within this zone would be uses subject to review. Development within the Scenic Preservation Overlay District must be designed in a manner that protects the environmental and historical assets of the area. All site design and development must be done in a manner that minimizes impacts upon scenic views or vistas. Design plans must take into account characteristics of soils, slopes, and geological hazards, in a manner intended to protect the health, safety, and welfare of users of the site, and the scenic value of the site. Design of the site must include safe, convenient, and adequate arrangements for pedestrian circulation, roadways. driveways, off-road parking, and loading space. Additional setbacks, landscaping, screening, or design requirements may be required by the county in order to preserve the natural, pristine appearance of the area and to minimize the visual impact to viewsheds and view corridors.

Mineral Creek also has a small area in the Town/County Zone of Mutual Interest where it runs near Silverton. The intent of the Town/County Zone of Mutual Interest is to provide for cooperative approval and review of development and uses that might occur in that area of the county that is adjacent to the Town of Silverton in which it is anticipated that town streets, water, sewer, and other public services might be extended, and which might be subject to annexation at some point in the future by the town. Any proposed development or use within this zone must be reviewed by both the Town of Silverton and San Juan County. The Town/County Zone of Mutual Interest identifies areas which, because of their proximity to the town of Silverton, are deemed to be subject to a commonality of interest by both the town and county in regards to future development. Any development that would occur along Mineral Creek would not interfere with the recreation classification of the river.

#### Potential for conflict with existing and potential land uses



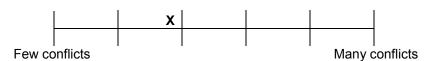
#### **Mineral Potential**

Mineral Creek is the site of numerous exploration and production activities, beginning in the 1870s. Most mines shut down in the 1920s, though small-scale exploration continues. The area is favorable for polymetallic alteration within the Silverton Caldera.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the agencies or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

Oil and gas potential is low to none.

#### Potential for conflict with minerals



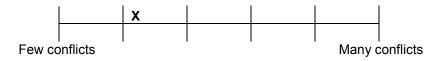
# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists three diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 8.6 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights, though a recent application for conditional water rights has been filed by a public entity to support future expected development in this corridor and development of new water facilities. Town of Silverton municipal water intake is on a tributary to Mineral Creek.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

Short sections of riprap protect the stream crossings at the South Mineral Creek Road, the Ophir Pass Road at Burro Bridge, U.S. Highway 550, and the mining structures at the Silver Ledge Mine. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The San Juan Skyway, U.S. Highway 550, is within the river corridor for 9.1 miles. There are an additional 1.2 miles of road leading to South Mineral Creek, which is maintained for passenger cars. There are 3.4 miles of road not maintained for passenger cars, which includes access roads to U.S. Basin. The Columbine Lake Trail is within the river corridor for 0.3 mile. San Miguel Power has a power line and substation within the river corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

Mineral Creek is along the San Juan Scenic Byway, which is driven for the scenery in the area.

Other resource activities that may occur are mining and sheep grazing.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

Mineral Creek is along the San Juan Scenic Byway. In addition, the Chattanooga iron fen is a Colorado Natural Heritage Program potential conservation area.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming in to retirees. The tourist services are directly associated with the San Juan Scenic Byway that follows the stream and accesses Silverton.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Mineral Creek is found suitable for designation as a WSR under the Preferred Alternative. The ORVs of Mineral Creek, particularly the Chattanooga iron fen, are very significant. In contrast with Cement Creek and its iron fens, Mineral Creek presents fewer conflicts to protecting the ORVs: there is a much lower percentage of private land involved, there are fewer existing developments, etc. The major potential conflicts on Mineral Creek would be renewed mining activity or development of the private lands in a potential economic development corridor identified by San Juan County.

Alternative approaches to protecting Mineral Creek include establishment of instream flows and perhaps some form of special management area for the purposes of conserving the Chattanooga iron fen. WSR designation, however, is determined to be the best form of protection, providing similar or better protections than the combination of instream flows and special management prescription while providing the additional recognition of the recreation and scenery ORVs, and could complement the All-American Road and national scenic byway status of the nearby San Juan Skyway.

Comments received on the Draft EIS raised concerns with impacts to future water development, mining, and continued use of county roads. As noted elsewhere, USFS guidance (Forest Service Handbook 1909.12 Chapter 80) states that proposed water developments "would be analyzed as to their effect on a river's free-flow, water quality, and outstandingly remarkable values, with adverse effects prevented to the extent of existing agency authorities." In some cases, the results of this analysis could lead to a decision to prevent certain new developments and could result in requiring mitigation measures for other developments. The town of Silverton currently obtains water from a tributary to Mineral Creek. This existing water rights and delivery system are documented above and are consistent with the finding of suitability.

Forest Service Handbook 1909.12 also provides guidelines for managing mineral development activities. For locatable minerals such as gold, silver, or rare earths, the handbook states that activities "shall be conducted in a manner that minimizes surface disturbance, sedimentation and pollution, and visual impairment." Agency policy does not necessarily prohibit mineral development along suitable reaches.

County-maintained roads are also documented above and their continued use and maintenance are consistent with the "recreation" classification.

Mineral Creek has been discussed by the Animas River Workgroup. When the Animas River Workgroup publishes a summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

# South Fork Mineral Creek (and portions of Cataract Creek, Porcupine Creek and unnamed tributaries)

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with Mineral Creek and the entire stream was found eligible. The total length of river found eligible was 7.41 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a recreation classification. This classification was chosen because of the roads that parallel the stream for nearly the entire segment. There is also a developed campground within the river corridor.

**Land Ownership:** Land ownership is split between NFS and private land. The following table is a breakdown of land ownership along this segment, in miles.

Table D.32: Miles by Ownership

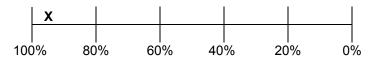
NFS	Private	Total	% NFS
7.16	0.25	7.41	96.6%

The following table is a breakdown of the ownership within the river corridor in acres.

Table D.33: Acres by Ownership

NFS	Non- Federal	Private	Total	% NFS
2,286.79	6.16	82.89	2,375.84	96.3%

## Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

**Ecology:** There is an important ecological feature of the iron fen/wetland complex at the mouth of South Fork Mineral Creek. Iron fens have state and global ecological ratings of 2, meaning that they are rare or imperiled within the state and worldwide. Currently there are only 13 iron fens known globally. South Fork Mineral Creek is a Colorado Natural Heritage Program potential conservation area.

**Wildlife**: Four breeding colonies of black swifts, a bird that is vulnerable in Colorado, were found at waterfalls within South Fork Mineral Creek corridor, on Porcupine Creek, Cataract Creek, and unnamed tributaries. The nest sites are behind or adjacent to waterfalls, where the mist from the falls waters the mosses that make up the nest. The black swift worldwide breeding distribution is limited to a narrow portion of the Rocky Mountains from Mexico to British Columbia, and a narrow band along sea cliffs overlooking the Pacific coast from California to Alaska. The SJNF planning area provides a significant contribution to the species' worldwide breeding distribution by providing a core breeding population and by providing critical connectivity within the southern Rocky Mountains portion of its range. Of the 10 locations on the SJNF that have black swift nest sites, three were chosen as outstandingly remarkable because they contained the best clusters of nests.

# **Existing and Potential Land Uses**

South Fork Mineral Creek would be managed as a recreation corridor up to South Mineral Campground, and as a natural landscape with limited management upstream from the campground. This is compatible with the ecology and wildlife ORVs.

South Fork Mineral Creek is located in the Mountain Zoning District of the San Juan County Zoning and Land Use Regulation. The intent of the Mountain Zoning District is to preserve the natural environment of the mountains of San Juan County while allowing activities normally occurring in these mountains. Within the Mountain Zoning District, only mining and milling, and activities which do not involve any construction or development of any sort (such as grazing, camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. All other uses within the Mountain Zoning District would be uses subject to review. The minimum parcel or lot area would be five acres. The minimum setback would be 50 feet from the property line. This type of development would not interfere with the recreation classification of the river.

#### Potential for conflict with existing and potential land uses



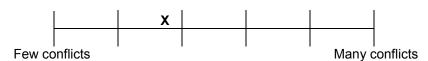
#### **Mineral Potential**

South Fork Mineral Creek has had exploration activities beginning in the 1870s. Most mines shut down in the 1920s. There is no current production. The area is favorable for polymetallic alteration within the Silverton Caldera.

See FEIS Chapter 3 for a further discussion of mining activities allowed if a river is found suitable by the agencies or if it is designated by Congress or the Secretary of the Interior. In brief, in a recreation classification, mining activities are allowed as long as they do not diminish the ORVs, do not change the classification, and are not operating in a way that causes "undue degradation."

Oil and gas potential is low to none.

#### Potential for conflict with minerals



# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

Minor bank protection and fishery habitat improvements exist near South Mineral Campground, but these do not detract from the free-flowing character of the river.

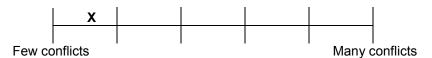
#### Potential for conflict with water resources development



# **Transportation and Facilities**

Within the river corridor there are 3.6 miles of road maintained for passenger cars and 4.1 miles of road not maintained for passenger cars. The Ice Lakes Basin Trail is also within the river corridor for 0.6 mile. There is also camping at the South Mineral Campground, as well as dispersed camping at select locations along the river.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The South Fork Mineral Creek area contains a campground and dispersed camping. There are also a number of hiking and mountain-biking opportunities on trails near the river.

Other activities that may occur include mining and livestock grazing.

#### Potential for conflict with recreation and other resources



## **Special Areas**

South Fork Mineral Creek is a Colorado Natural Heritage Program potential conservation area.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming in to retirees. The tourist services are related to the use of the area around South Fork Mineral Creek. The stream is close to the town of Silverton and people camping in the designated and dispersed campgrounds regularly go into Silverton.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County.

# **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

South Fork Mineral Creek is found to be suitable under the Preferred Alternative. This stream segment contains another major iron fen community and provides for outstanding black swift nesting sites with a relatively high concentrations of nests. There are very few conflicts to protection of the river. Renewed mining interest and existing recreational and transportation facilities present the most immediate threats. Alternatives to WSR protections would include a combination of instream flow protections (e.g., to protect black swift nesting sites) and special management prescriptions for the maintenance of the fen community. WSR designation, however, is determined to be the best form of protection, providing similar protections but with additional surety and potential marketing benefits. Protections of South Fork Mineral Creek's ORVs would greatly complement the protections provided for black swift nests in the West Dolores drainage and the protections of iron fen communities in nearby Mineral Creek. In combination, protecting these streams would greatly increase the odds for successfully conserving the rare iron fen plant communities and critical nesting habitat of a relatively rare bird species.

Comments received on the Draft EIS for South Mineral Creek were similar to those identified for Mineral Creek above.

South Fork Mineral Creek has been discussed by the Animas River Workgroup. When the Animas River Workgroup publishes a summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

## West Fork Animas River in California Gulch

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with the Animas River and the entire stream was found eligible. The total length of river studied and found eligible was 3.16 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire segment has a recreation classification. There is a four-wheel-drive road that follows the stream throughout its length.

**Land Ownership:** Land ownership along the segment is split between BLM and private lands. Table D.34 is a breakdown of the ownership along the river in miles of river.

Table D.34: Miles by Ownership

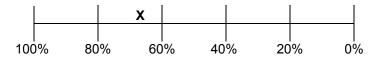
BLM	Private	Total	% Federal (BLM)
2.03	1.13	3.16	64.1%

Table D.35 is a breakdown of the ownership within the river corridor in acres.

Table D.35: Acres by Ownership

BLM	Private	Total	% Federal (BLM)
702.36	374.76	1,077.12	65.2%

# Amount of federally owned land within the river corridor



# **Outstandingly Remarkable Values**

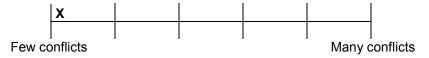
**Ecology:** The Colorado Natural Heritage Program has identified an important ecological community of altai cottongrass and clustered sedge (*Carex cumulata*), wetland plants that grow near the stream. Altai cottongrass communities are unique to the alpine tundra. Altai cottongrass has a state ecological rating of 3, meaning it is vulnerable within the state. Clustered sedge has global and state ecological ratings of 3 and 2, respectively, meaning it is vulnerable globally and rare or imperiled within the state. California Gulch is a Colorado Natural Heritage Program potential conservation area.

# **Existing and Potential Land Uses**

This corridor is within the Silverton special management area, emphasizing mining heritage and motorized roads in the alpine. This is compatible with the scenic and ecology ORVs.

California Gulch is located in the Mountain Zoning District of the San Juan County Zoning and Land Use Regulation. The intent of the Mountain Zoning District is to preserve the natural environment of the mountains of San Juan County while allowing activities normally occurring there. Within the Mountain Zoning District, only mining and milling, and activities that do not involve any construction or development of any sort (such as grazing, camping, picnicking, hiking, and outdoor recreation) would be permitted as uses by right. All other uses within the Mountain Zoning District would be uses subject to review. The minimum parcel or lot area would be 5 acres. The minimum setback would be 50 feet from the property line. This type of development would not interfere with the recreation classification of the river

#### Potential for conflict with existing and potential land uses



## **Mineral Potential**

This area is the site of numerous exploration and production activities, beginning in the 1870s. Most mines shut down in the 1920s. The area is favorable for polymetallic alteration within the Silverton Caldera.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County.

There is no oil and gas potential.

#### Potential for conflict with minerals



Few conflicts Many conflicts

# **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists four diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 0.124 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There is little or no riprap or other channel modifications on the stream.

# Potential for conflict with water resources development



# **Transportation and Facilities**

Within the river corridor there are 4.3 miles of road that are not maintained for passenger cars.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The main recreational activity in the area is sightseeing and driving the four-wheel-drive road along the river, as well as use of the road by ATVs.

Other activities that may occur in this area include livestock grazing and mining.

#### Potential for conflict with recreation and other resources



## **Special Areas**

California Gulch is a Colorado Natural Heritage Program potential conservation area.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in San Juan County is tourism (58%). This consists mainly of second homes and tourist services. The second highest segment of the economic base is funds coming in to retirees. The tourist services are related to the use of the area around California Gulch, where people are drawn to the mining heritage and opportunity to drive in the high mountains.

Other sources indicate the potential for mining to return to a position of significant long-term economic importance in San Juan County

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

West Fork Animas River in California Gulch is not found suitable under the Preferred Alternative. The ORVs of California Gulch are fairly modest when compared to other streams of the planning unit. There are relatively few conflicts facing the protection of the altai cottongrass and clustered sedge communities, but the high percentage of private land along the stream corridor could preclude WSR designation. The stream is currently offered some protection under the Silverton special management area designation. Further protection of the plant communities could be provided through instream flow protections under the CWCB. Also, the BLM would work with San Juan County to address future development plans that could affect these imperiled plant communities.

Comments expressed concern for interfering with proposed water developments and mining.

#### Suitability Determination

Miles found suitable by classification are provided in Table D.36 and are illustrated on Figure D-2 Animas River and Tributaries.

Table D.36: Miles Found Suitable by Classification

	Wild	Scenic	Recreation	Total
Animas River - Bakers Bridge to Silverton*	0	0	27.19	27.19
Cement Creek	0	0	0	0
Cinnamon Creek	0	0	0	0
Maggie Gulch	0	0	0	0
Mineral Creek	0	0	8.65	8.65
South Fork Mineral Creek	0	0	7.41	7.41
California Gulch/West Fork Animas	0	0	0	0
Animas River Totals	0	0	43.25	43.25

<sup>\*</sup>End of segment moved to 3.58 miles below Silverton.

#### **Outstanding Issues and Conflicts to be Resolved**

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

## Wild and Scenic Rivers Animas River and Tributaries San Juan National Forest

### San Juan National Forest and Tres Rios Field Office Figure D-2



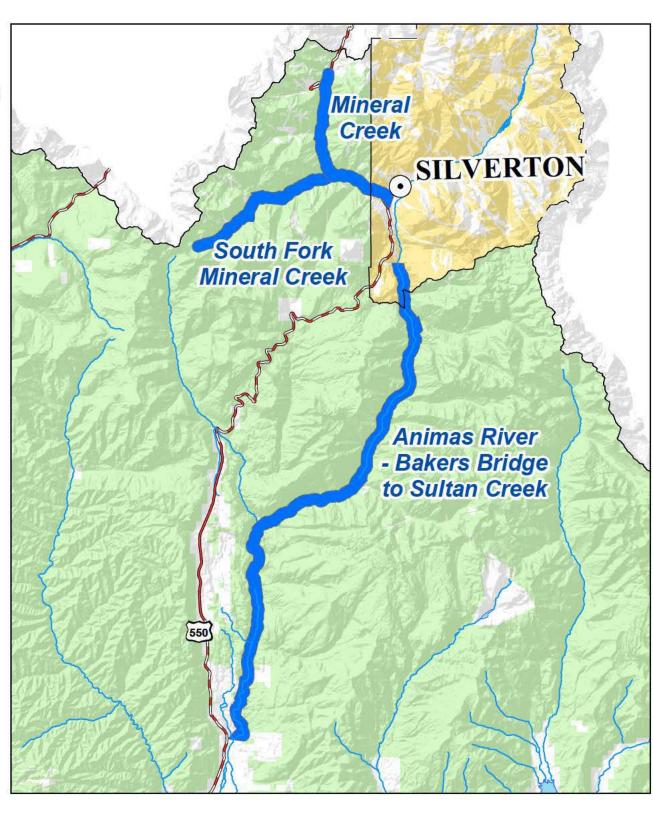




The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs w thout notificat on.

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MDR NAD 83, Polyconic Projection May 30, 2013



#### **Hermosa Creek River System**

#### Hermosa Creek and Tributaries

**Location:** Hermosa Creek was studied from its headwaters to its confluence with the Animas River. Hermosa Creek was found eligible from its headwaters to the SJNF boundary, after which there are many diversions. Thirteen tributaries of Hermosa Creek were studied and nine were found eligible. The total length of river studied was 84.37 miles and the total found eligible was 62.28 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** Throughout the Hermosa Creek watershed there are portions of wild, scenic, and recreation classifications (Table D.37).

Table D.37: Miles per Eligible Segments

Name	Wild	Scenic	Recreation	Total
Big Bend Creek	4.43	0	0	4.43
Big Lick Creek	0.76	0	0	0.76
Clear Creek	0	5.36	0	5.36
Corral Creek	1.65	0	0	1.65
Deer Creek	2.72	0	0	2.72
East Fork Hermosa Creek	0	0	6.70	6.70
Elk Creek	4.25	0	0	4.25
Hermosa Creek	0	28.08	0	28.08
South Fork Hermosa Creek	5.89	0	0	5.89
West Cross Creek	2.44	0	0	2.44
Hermosa Creek Totals	22.14	33.44	6.70	62.28

The East Fork Hermosa Creek has a road that follows its entire length, making it a recreation classification. Both Clear Creek and Hermosa Creek have trails designated for ATV and motorcycle use, making them scenic segments. Big Bend Creek, Big Lick Creek, and South Fork Hermosa Creek all have trails along some portion of the segment. The other creeks do not have any development near them.

**Land Ownership:** The majority of the land along Hermosa Creek and its tributaries is owned by the SJNF with a small portion of private land along the East Fork Hermosa Creek and Hermosa Creek. The following is a breakdown of the ownership along the river in miles (Table D.38).

Table D.38: Miles by Ownership

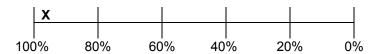
Name	NFS	Private	Total	% NFS Owned
Big Bend Creek	4.43	0.00	4.43	100.0%
Big Lick Creek	0.76	0.00	0.76	100.0%
Clear Creek	5.36	0.00	5.36	100.0%
Corral Creek	1.65	0.00	1.65	100.0%
Deer Creek	2.72	0.00	2.72	100.0%
East Fork Hermosa Creek	6.52	0.18	6.70	97.3%
Elk Creek	4.25	0.00	4.25	100.0%
Hermosa Creek	27.03	1.05	28.08	96.3%
South Fork Hermosa Creek	5.89	0.00	5.89	100.0%
West Cross Creek	2.44	0.00	2.44	100.0%
Hermosa Creek Totals	61.05	1.23	62.28	98.0%

Table D.39 is a breakdown of the ownership within the river corridor in acres.

Table D.39: Acres by Ownership

Name	NFS	Private	Total	% NFS
Big Bend Creek	1,445.71	0.00	1,445.71	100.0%
Big Lick Creek	295.25	0.00	295.25	100.0%
Clear Creek	1,743.42	0.00	1,743.42	100.0%
Corral Creek	586.30	0.00	586.30	100.0%
Deer Creek	917.40	0.00	917.40	100.0%
East Fork Hermosa Creek	1,943.76	53.12	1,996.88	97.3%
Elk Creek	1,372.24	0.00	1,372.24	100.0%
Hermosa Creek	7,301.32	115.32	7,416.64	98.4%
South Fork Hermosa Creek	1,850.50	0.00	1,850.50	100.0%
West Cross Creek	831.69	0.00	831.69	100.0%
Hermosa Creek Totals	18,287.59	168.44	18,456.03	99.1%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

The Hermosa watershed is unique for high-purity Colorado River cutthroat reintroduction in the limestone outcropping that bisects many of the tributaries on both the east and west sides of Hermosa Creek provides a barrier to upstream migration of other fish species. Also, the proximity of the numerous tributaries would allow a vibrant and stable population of cutthroat in the mainstem that could draw from each of the tributaries. Such a meta-population is much more resilient and can survive damaging events in any one tributary, without threatening the whole population. Big Bend Creek, Clear Creek, and East Fork Hermosa Creek are three of 12 sites within the SJNF that contain genetically pure strains of Colorado River cutthroat trout. In addition, they are part of the Hermosa Creek watershed and have potential for meta-population reintroduction, as does the rest of the Hermosa Creek watershed. Since cutthroat reintroduction is one of the ORVs, any WSR suitability finding or designation would include the required steps of fish-barrier construction and elimination of non-native fish.

The Hermosa Creek Trail is utilized by five outfitters, primarily for hunting and mountain biking. It is one of the most popular mountain bike trails in southwest Colorado due to the trail paralleling the Hermosa Creek drainage for 23 miles. It is also popular with horseback riders and OHV users because of the easy access to the lower trailhead from Durango. OHV riders find it unique because it is one of the few motorized trails that is surrounded by undeveloped mountainous country.

#### **Existing and Potential Land Uses**

The majority of the Hermosa Creek drainage is split between management where natural processes dominate and natural landscapes with limited management. Tributaries on the west side (Clear Creek, South Fork Hermosa Creek, Deer Creek, West Cross Creek) are predominantly in the management theme where natural processes dominate. Elk Creek and Big Lick Creek on the west side are in a natural landscape with limited management. East Fork Hermosa is predominantly in a recreation management corridor with some portions being within the Durango Mountain Resort ski area. This management is compatible with the recreation and fisheries ORV.

The private land portion is not zoned by La Plata County, but is currently used as agricultural property.

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

There is favorable occurrence for minerals in Clear Creek and South Fork Hermosa Creek within the "Au-Ag-Te replacement veins and skarns" of the La Plata Mining District. There has been no production and no extensive exploration in the watersheds of these streams.

The lower portion of the mainstem of Hermosa Creek has areas favorable for sandstone uranium deposits. Above the area considered for WSR designation, there is potential for vanadium/uranium deposits. The Graysill mine was operated for uranium and vanadium from 1945 to 1967, but it is on a small stream not considered in the WSR inventory. There is no production in any location in the watershed of Hermosa Creek.

The oil and gas potential is low.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists three diversions in the corridor of
  this stream. For those with decreed capacity listed, the total diversion is 1.5 cfs. One of those
  water rights, totaling 1.5 cfs, has since come under the ownership of the Colorado Water Trust.
  The trust is a non-profit organization that engages in and supports voluntary efforts to restore and
  protect stream flows in Colorado to sustain healthy aquatic ecosystems.
- The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights on East Fork Hermosa of 4.54 cfs and 414 ac. ft
- 3. The SWSI report shows 19 conditional rights for wells and reservoirs in the corridor of East Fork Hermosa and three more in the surrounding watershed. The CWCB has also mapped one potential reservoir site, but it has not been verified for feasibility. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There is little if any riprap or other channel modification in the Hermosa or its tributaries

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

There are 14.5 miles of the Hermosa Creek Trail, which is open to motorcycles within the river corridor of the mainstem. There are also connecting pieces of the trails up the tributaries, for a total of 19.1 miles of trail within the river corridor along the mainstem.

There is a 5.4-mile trail along Clear Creek, which is also open to motorcycles.

There are 5.0 miles of non-motorized trail in South Fork and 4.5 miles of non-motorized trail in Big Bend Creek.

Clear Creek has 0.7 mile of road maintained for passenger cars at its upper end, as well as 2.0 miles of closed logging roads.

There are 1.3 miles of road maintained for passenger cars at the lower end of Hermosa Creek used to access the Lower Hermosa Campground/Trailhead. In the upper Hermosa there are 1.9 miles of road maintained for passenger cars, though access for cars is limited by a ford across Hermosa Creek, as well as 3 miles of road not maintained for passenger cars. The upper end of the Hermosa mainstem also has 1.3 miles of closed timber roads near Grassy Creek.

West Cross Creek has 0.5 mile of closed timber roads at its upper end.

In the East Fork Hermosa there are 6.1 miles of road maintained for passenger cars and 5.2 miles of road that are closed timber and ski area roads.

There are also a number of facilities within the river corridor. These include Sig Creek Campground, the Upper Hermosa Trailhead, and ski lift facilities for Durango Mountain Resort.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

The Hermosa Creek Trail is utilized by five outfitters, primarily for hunting and mountain biking. It is one of the most popular mountain bike trails in southwest Colorado due to the trail paralleling the Hermosa Creek drainage for 23 miles. It has also become popular with horseback riders and OHV users. Hermosa Creek is also being utilized by extreme kayakers who put in at the Upper Hermosa Creek Trailhead located west of Durango Mountain Resort (Purgatory ski area). It is rated Class IV and V and recommended for expert kayakers only. It is also nationally significant for whitewater recreation. Its listing on American Whitewater's national river inventory, while not sufficient by itself to be an ORV, supports the above analysis.

There is also fishing in Hermosa Creek and East Fork Hermosa Creek. Durango Mountain Resort is used for skiing within the watershed. The East Fork and Upper Hermosa area is increasingly used by snowmobiles.

Other activities that occur in the area include livestock grazing and hunting, with minor timber harvest in the watershed of the East Fork.

#### Potential for conflict with recreation and other resources



#### Special Areas

Hermosa Creek has been named among the Outstanding Waters of the U.S.

#### Socioeconomic Environment

Most of the river segments are in La Plata County. According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part (34%) of the economic base in La Plata County is tourism and this is mostly resorts. The second highest segment of the economic base is funds coming in to retirees. The Hermosa Creek watershed is largely used for tourist activities, including hunting, fishing, and mountain biking.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Hermosa Creek is found to be suitable under the Preferred Alternative. Hermosa Creek presents perhaps the best opportunity for re-establishment and conservation of the Colorado River cutthroat trout within the SJNF and, possibly, across the current range of the species. The unique landforms, high quality of water, and relatively undisturbed river and associated uplands of Hermosa Creek all contribute to this ORV. In turn, these same factors contribute to the recreational aspects of the river corridor.

There are few conflicts with protection of the stream since much of the reach falls within a USFS roadless area and would be managed to maintain natural processes or natural landscapes with limited management. In recent years, CPW, in conjunction with the USFS, have completed several Colorado River cutthroat projects, some of which have involved modest structures within the stream channels. Such work performed in direct support of the fishery ORV would not be in conflict with the continued protection of the fishery ORV. There are few water rights within the drainage and they would not be greatly affected by protecting the ORVs. Alternative approaches to protecting the ORVs could include wilderness designation for portions of the drainage, additional instream flows for Hermosa Creek and the major tributaries, and continued management direction to benefit the ORVs. WSR designation, by itself or in conjunction with the other protection options, would provide greater emphasis on the stream and its function, and would likely be strongly supported by other agency partners in the conservation of the Colorado River cutthroat and the many users and nearby residents who value this river system. WSR designation is determined to be the best option for overall protection for Hermosa Creek and the identified tributaries due to few conflicts with other uses, the strong protection that would be provided the ORVs, and the opportunity to fully protect the free-flowing character of a relatively large stream system.

Essentially all comments on the Draft EIS specific to Hermosa Creek suitability were supportive of the findings in the draft.

The Hermosa Creek Workgroup was initiated in the spring of 2008 and resulted in a report published in June 2010. This effort was conducted outside the USFS's WSR review process but initiated, in part, in response to the findings presented in the Draft EIS. The workgroup and its report focused on potential management actions for the entire Hermosa Creek watershed and did not reach a final conclusion regarding WSR status. The workgroup instead postponed developing final positions on WSR status until Hermosa Creek could be looked at in a broader context along with the outcomes of other similar river protection workgroup processes in southwest Colorado—a process proposed to begin sometime during 2013.

At the completion of the Hermosa Creek Workgroup's discussions, some of the participants drafted legislative concepts to provide to the congressional delegation for possible legislative protections for the watershed. A bill was introduced on July 18, 2012, to designate 108,000 acres as the Hermosa Creek Watershed protection area, but no final action was taken prior to the end of that Congress.

The final report of the Hermosa Creek Workgroup would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Suitability Determination

Miles found suitable by classification are provided in Table D.40 and are illustrated on Figure D-3 Hemosa River and Tributaries.

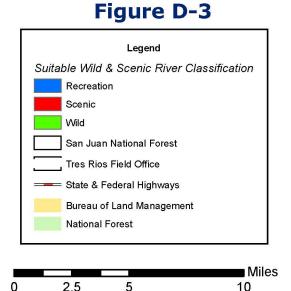
Table D.40: Miles Found Suitable by Classification

Name	Wild	Scenic	Recreation	Total
Big Bend Creek	4.43	0	0	4.43
Big Lick Creek	0.76	0	0	0.76
Clear Creek	0	5.36	0	5.36
Corral Creek	1.65	0	0	1.65
Deer Creek	2.72	0	0	2.72
East Fork Hermosa Creek	0	0	6.70	6.70
Elk Creek	4.25	0	0	4.25
Hermosa Creek	0	28.08	0	28.08
South Fork Hermosa Creek	5.89	0	0	5.89
West Cross Creek	2.44	0	0	2.44
Hermosa Creek Totals	22.14	33.44	6.70	62.28

#### **Outstanding Issues and Conflicts to be Resolved**

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

# Wild and Scenic Rivers Hermosa Creek and Tributaries San Juan National Forest and Tres Rios Field Office

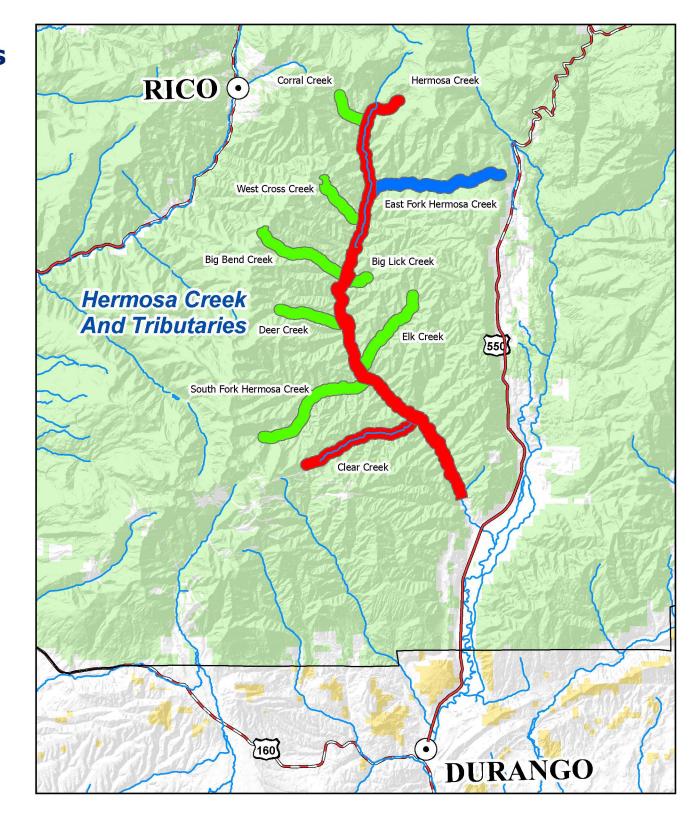




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MDR NAD 83, Polyconic Projection May 30, 2013



#### **Los Pinos River System**

Eligible portions of the Los Pinos River and tributaries, and their classification, are as follows. Details for each segment are below (Table D.41).

**Table D.41: Miles per Eligible Segments** 

	Wild	Scenic	Recreation	Total
Los Pinos, above Vallecito Reservoir	21.89	0.00	0.00	21.89
Lake Creek	8.05	0.00	0.00	8.05
Flint Creek	7.03	0.00	0.00	7.03
Sierra Vandera Creek	3.67	0.00	0.00	3.67
Snowslide Gulch	3.51	0.00	0.00	3.51
Rincon la Osa	5.69	0.00	0.00	5.69
Rincon la Vaca	4.33	0.00	0.00	4.33
Los Pinos Totals	54.17	0.00	0.00	54.17

#### Los Pinos River and Tributaries above Vallecito Reservoir

**Location:** The Los Pinos River was considered from its headwaters to the New Mexico border. The Los Pinos River was found eligible from its headwaters to the private land boundary. Eleven tributaries off Los Pinos River above Vallecito Reservoir were studied and six were found eligible. The total length of river studied above Vallecito Reservoir was 72.14 miles and the total found eligible was 54.17 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** All of these segments have a wild classification. This classification is based on the fact that all the segments are within the Weminuche wilderness area and can only be accessed by trail.

**Land Ownership:** Land ownership along the segments is entirely NFS lands. Table D.42 is a breakdown of the ownership along the river in miles.

Table D.42: Miles by Ownership

Name	NFS	Total	% NFS
Los Pinos, above Vallecito Reservoir	21.89	21.89	100.0%
Lake Creek	8.05	8.05	100.0%
Flint Creek	7.03	7.03	100.0%
Sierra Vandera Creek	3.67	3.67	100.0%
Snowslide Creek	3.51	3.51	100.0%
Rincon la Osa	5.69	5.69	100.0%
Rincon la Vaca	4.33	4.33	100.0%
Los Pinos	54.17	54.17	100.0%

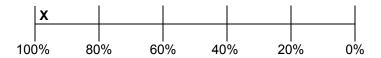
Table D.43 is a breakdown of the ownership within the river corridor in acres.

Table D.43 - Acres by Ownership

Name	NFS	Private	Total	% NFS
Los Pinos, above Vallecito Reservoir	5,987.62	4.42	5,992.04	99.9%
Lake Creek	2,564.95	0.00	2,564.95	100.0%
Flint Creek	2,236.60	0.00	2,236.60	100.0%
Sierra Vandera Creek	1,166.12	0.00	1,166.12	100.0%
Snowslide Creek	964.45	0.00	964.45	100.0%

Name	NFS	Private	Total	% NFS
Rincon la Osa	1,755.99	0.00	1,755.99	100.0%
Rincon la Vaca	1,379.80	0.00	1,379.80	100.0%
Los Pinos	16,055.53	4.42	16,059.95	100.0%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Scenery:** The Los Pinos River and the tributaries were previously studied and recommended for WSR designation. The ORV determined in the 1979 study was scenery. Its inclusion in the Weminuche wilderness has maintained those values.

#### **Existing and Potential Land Uses**

These streams are all within the Weminuche wilderness.

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

The geology is not favorable for locatable mineral deposits.

There is no oil and gas potential.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists one diversions in the corridor of this stream. The Weminuche Pass Ditch has a decreed capacity of 40 cfs and transports water out of the basin
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There is little or no riprap on these streams, as they are in the wilderness.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The entire segment is located within the wilderness; therefore, there are no roads in this area. However, there are many trails along the mainstem and tributaries. There are 22.3 miles of trail in the river corridor along the mainstem, 8.8 miles in the Lake Creek corridor, 8.0 miles in the Flint Creek corridor, 4 miles in the Sierra Vandera Creek corridor, 3.2 miles in the Snowslide Canyon corridor, 4.3 miles in the Rincon la Osa corridor, and 3.2 miles in the Rincon La Vaca corridor.

#### Potential for conflict with transportation and facilities

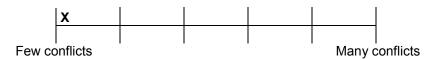


#### **Recreation and Other Resource Activities**

The main recreational use of this area is for hiking, fishing, backpacking, camping, horseback riding, and packing. The trail along the river is heavily used since it is one of the main access routes into the Weminuche wilderness.

Other activities that may occur in this area include grazing of horses and pack stock.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

The entire length is within the Weminuche wilderness. This river was also previously recommended for WSR designation in legislation introduced in 1983.

#### Socioeconomic Environment

According to the Lake City and Hinsdale County Community Plan (Hinsdale County 2006), Hinsdale County encompasses 1,118 square miles. Hinsdale is one of the least populated counties in Colorado and the 15th lowest in the nation, with less than one person (0.7) per square mile—96% of its acreage is public land, 46% of which is wilderness. The majority of county residents live in Lake City or within a 15-mile radius. The county was built on mining, ranching, and recreation. Because of the transportation and access, much of the economic benefit from the use of this portion of the wilderness likely goes to La Plata County instead of Hinsdale County.

#### **Current Administration and Funding Needs**

Finding this stream suitable for Wild and Scenic would not dramatically change the use or management in this area; therefore the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The Los Pinos River and identified tributaries are found suitable under the Preferred Alternative. This river segment was previously found suitable and there have been essentially no changes to management or in the conflicts with protecting the scenery ORV since that finding. The eligible portion of the Los Pinos remains somewhat unique within Colorado as an extensive river drainage falling entirely within designated wilderness. Wilderness designation does provide substantial protections for the stream and

the scenery ORV. Designation as a WSR, however, is determined to be the best approach for ensuring the free-flowing character of the stream while complementing the protections of the ORV received through wilderness designation. WSR designation would preclude dam construction such as that previously proposed on Lake Creek and would ensure protection from additional trans-basin diversion of the stream's headwaters. Comments on the Draft EIS were generally supportive of the analysis presented in the draft. One comment questioned whether WSR suitability was needed within a designated national wilderness area. Although it is dependent on the ORVs and other issues related to particular stream segments, there is nothing inherently precluding overlapping wilderness and WSR designations.

The Vallecito Creek/Pine River Workgroup was initiated in June 2010 and resulted in a report published in October 2011. This effort was conducted outside the USFS's WSR review process but initiated, in part, in response to the findings presented in the Draft EIS. The final report of the workgroup was not completed prior to the close of the comment period for the Draft EIS and could not fully be addressed here. It does, however, include a number of findings and suggestions that could assist federal, state, and local governments, as well as private landowners, in future management of the river and surrounding watershed.

The final report of the Vallecito Creek/Upper Pine River Workgroup would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Suitability Determination

Miles found suitable by classification are provided in Table D.44 and are illustrated on Figure D-4 Los Pinos River and Tributaries.

**Table D.44: Miles Found Suitable** 

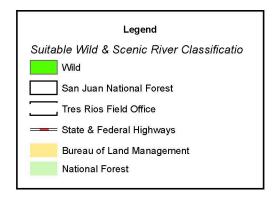
	Wild	Scenic	Recreation	Total
Los Pinos, above Vallecito Reservoir	21.89	0	0	21.89
Lake Creek	8.05	0	0	8.05
Flint Creek	7.03	0	0	7.03
Sierra Vandera Creek	3.67	0	0	3.67
Snowslide Gulch	3.51	0	0	3.51
Rincon la Osa	5.69	0	0	5.69
Rincon la Vaca	4.33	0	0	4.33
Los Pinos Totals	54.17	0.00	0.00	54.17

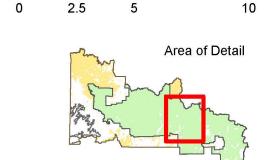
#### Outstanding Issues and Conflicts to be Resolved

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

# Wild and Scenic Rivers Los Pinos and Tributaries San Juan National Forest and Tres Rios Field Office

Figure D-4



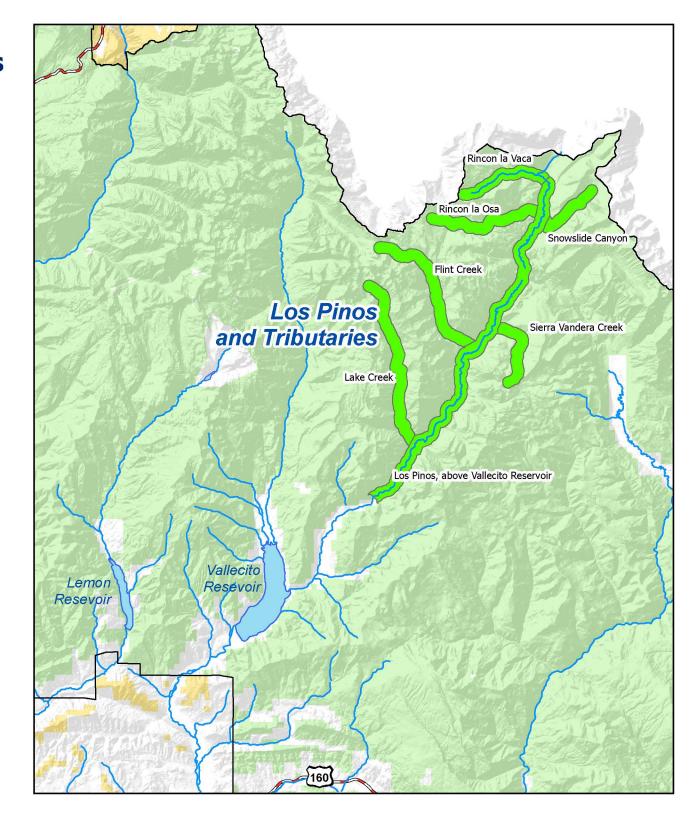


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■ Miles

MDR NAD 83, Polyconic Projection May 30, 2013



#### **Vallecito Creek**

#### Vallecito Creek

**Location:** The stream was studied from its headwaters to Vallecito Reservoir, and the stream was found eligible from its headwaters to the boundary with private land. The total length of river studied was 22.15 miles and the segment found eligible was 16.59 miles (Table D.45). The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs above the private land north of Vallecito Reservoir.

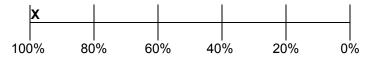
**Table D.45: Miles per Eligible Segments** 

	Wild	Scenic	Recreation	Total
Vallecito Creek	16.59	0	0	16.59

**Wild and Scenic Classification:** This entire segment has a wild classification. This classification was chosen because the entire segment is within the Weminuche wilderness and can only be accessed by trail.

**Land Ownership:** The entire segment is within land owned by the SJNF. There are 5,242.74 acres of land within the river corridor.

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Recreation:** Vallecito Creek is popular with extreme kayakers due to its difficulty (Class V+) and the sheer-walled granite canyon, which provides extremely narrow slots. It is recommended for expert kayakers only. It has crystal-clear water flowing through an incredible gorge with some of the highest-quality drops to be found. It is also nationally significant for whitewater recreation. Its listing on American Whitewater's national river inventory, while not sufficient by itself to be an ORV, supports the above analysis.

**Scenery:** The valley also provides outstanding views of the stream in the impressive granite canyon and the views of surrounding mountains.

#### **Existing and potential land uses**

This stream is within the Weminuche wilderness.

#### Potential for conflict with existing and potential land uses

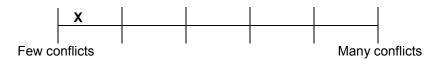


#### **Mineral Potential**

Vallecito Creek is east of the epithermal vein deposits, polymetallic veins and skarns and granitic uranium of the Needle Mountains Mining District. There was exploration in a tributary of Vallecito Creek, but not near the stream corridor of Vallecito Creek. There is no production within the watershed.

There is no oil and gas potential.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- The State of Colorado Water Rights Database (HydroBase) lists no diversions in the corridor of this stream.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There is little or no riprap on this stream, as it is in the wilderness.

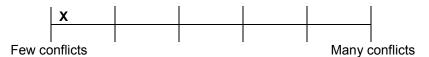
#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The entire river segment is located within the wilderness, so there are no roads in this area; however, there are 17.6 miles of trail within the river corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

Vallecito Creek is popular with extreme kayakers due to its difficulty and the sheer-walled granite canyon, which provides extremely narrow slots. This area is heavily used by hikers, backpackers, and horse packers as one of the main access routes into the Weminuche wilderness. Fishing, hunting, rock climbing, and camping occur in the river corridor.

There is limited grazing of recreational pack stock.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

This entire stream is within the Weminuche wilderness.

#### Socioeconomic Environment

According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in La Plata County is tourism

(34%). This consists mainly of resorts. The second highest segment of the economic base is funds coming in to retirees. The Weminuche wilderness is a draw for tourists who use trails, including Vallecito Creek Trail, for access.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Vallecito Creek is not found to be suitable under the Preferred Alternative. Similar to the Los Pinos River, Vallecito Creek is a lengthy drainage entirely within a designated wilderness area. Vallecito Creek, however, was not previously studied or found suitable as was the Los Pinos River. Vallecito Creek contains the ORVs of scenery and recreation. These ORVs receive substantial protection under the existing wilderness designation. There are few conflicts with the protection of these values. WSR designation could provide greater emphasis on river values.

Comments received on the Draft EIS generally encouraged adding wild and scenic protections in addition to National Wilderness System status; however, some questioned whether whitewater boating should be considered an ORV. WSR designations and wilderness designations do not necessarily protect the same resources or uses. In the case of Vallecito Creek, it is determined that the existing wilderness designation would adequately protect the stream's identified ORVs. Given that the entire stream segment falls within designated wilderness and that there are no existing private water rights or diversions, it has been determined that suitability is not needed. Whitewater boating in itself does not always constitute an ORV, but Vallecito Creek stands out in providing an extreme challenge through a highly scenic drainage.

The Vallecito Creek/Upper Pine River Workgroup was initiated in June 2010 and resulted in a report published in October 2011. This effort was conducted outside the USFS's WSR review process but initiated, in part, in response to the findings presented in the Draft EIS. The final report of the workgroup was not completed prior to the close of the comment period for the Draft EIS and could not fully be addressed here. It does, however, include a number of findings and suggestions that could assist federal, state, and local governments, as well as private landowners, in future management of the river and surrounding watershed.

#### **Suitability Determination**

No miles were found suitable, as indicated in Table D.46.

**Table D.46: Miles Found Suitable** 

	Wild	Scenic	Recreation	Total
Vallecito Creek	0	0	0	0

#### Outstanding Issues and Conflicts to be Resolved

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### **Piedra River System**

Eligible portions of the Piedra River and tributaries, and their classification, are as follows. Details for each segment are below (Table D.47).

**Table D.47: Miles per Eligible Segments** 

	Wild	Scenic	Recreation	Total
Piedra River	14.08	0	16.25	30.33
East Fork Piedra River	9.37	0	7.16	16.53
Middle Fork Piedra River	11.75	0	7.03	18.78
Piedra River Totals	35.20	0	30.44	65.64

#### Piedra River

**Location:** The stream segment is from the confluence of East Fork Piedra and Middle Fork Piedra to the SJNF boundary, a length of 30.33 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** The segment has a number of different eligibility classifications (Table D.48).

**Table D.48: Miles by Classification** 

Wild	Scenic	Recreation	Total
14.08	0	16.25	30.33

The areas of wild classification are upstream and downstream of the First Fork Trailhead within the first and second box canyons. These segments extend to the boundaries with private land. These two segments have no road access and are essentially primitive. There is a small portion between the two segments that is classified as recreation due to a road crossing the creek to reach a trailhead. The other recreation segments are upstream from the private boundary to the forks. There is a picnic area at the lower end of this segment and a road that parallels the river to the forks. The other recreation segment is downstream from the private land boundary to the SJNF boundary. This segment has many roads along it as well as a designated campground north of Highway 160.

**Land Ownership:** Land ownership is split between NS, private, and tribal land. Table D.49 is a breakdown of the miles of stream by ownership.

**Table D.49: Miles by Ownership** 

NFS	Private	Tribal	Total	% NFS
19.41	8.03	2.89	30.33	64.0%

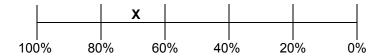
Table D.50 is a breakdown of the ownership within the river corridor in acres.

Table D.50: Acres by Ownership

١	res by Owners.	шр			
	NFS	Private	Tribal	Total	% NFS
	6,574.56	2,117.09	676.70	9,368.35	70.2%

Much of the private land is in the portion of the corridor south of Highway 160. Some of the NFS land in that portion of the corridor does not touch the stream.

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

The Piedra River north of Highway 160 and the East and Middle Forks in the wilderness were previously studied and recommended for WSR designation. The ORVs determined in the 1979 study were scenery, recreation, and geology. Our current study confirms and amplifies those findings. We also studied the river south of Highway 160 and found archeological ORVs.

**Recreation and Scenery:** This was recommended because of the quality rafting and kayaking of Class IV and V waters through two box canyons. This river offers exceptionally beautiful and varied wild trout fishing for large fish combined with a long and interesting Class IV whitewater run. It is listed at Riversearch.com as one of the best rafting vacations in the world. Its listing on American Whitewater's national river inventory, while not sufficient by itself to be an ORV, supports the above analysis

The outstandingly remarkable scenery is an incredibly scenic narrow box canyon and areas of hot springs.

**Geology:** In the upper reaches, deep and dramatic canyons cut through a complex of Tertiary Oligocene pyroclastics (ash flows, tuffs, and lava flows) (Tev) emplaced during creation of the San Juan volcanic field, a time of possibly the most violent volcanic explosions (caldera eruptions) of the last 4 billion years, with abundant recent glacial and post-glacial erosional features. In the lower reach of the Piedra River, canyons cut through a series of Paleozoic and pre-Cambrian sedimentary, metasedimentary, and metavolcanic rocks and igneous intrusives (Pc, PPrm, Ml, Doe, Ci, pCe, pCus, pCi) emplaced between 200 million and 2 billion years ago, representing nearly half of the geologic history of the planet and covering the period when life evolved from the simplest sea life to the first colonization of land by complex plant and animal forms. In a relatively short distance, the river system flows through rock from the most recent to among the most ancient exposures in western North America.

**Archeology:** The sites along the east bank of the river south of Highway 160 relate to early Anasazi cultural adaptation and habitation along the river course during Late Pueblo I and Early Pueblo II times. In addition, the sites relate to Chimney Rock and the rare, unique, and exemplary astronomical knowledge of the Anasazi about the northern lunar standstill event. The sites near the river are thought to be dwellings and farming sites for the population that supported the ceremonies at the kiva sites near the Chimney Rock spires.

#### **Existing and Potential Land Uses**

This stream system crosses many of the USFS management themes. At the lowest end, the corridor is within a special management area focused on the cultural resources near Chimney Rock and some areas for natural landscapes with limited management. This is compatible with protection of the cultural resource ORV.

The next section upstream parallels the recreation corridor along County Road 622 and is mostly in the Piedra Area or adjacent areas to be managed for wild characteristics. This is compatible with the recreation and scenery ORVs. The Piedra Area was established by the 1993 Colorado Wilderness Act to preserve its wilderness character, but does not include the entire stream segment and lacks the implied water rights protection of areas designated as wilderness.

Approximately 1.2 miles of the stream channel, accounting for 270 acres of private land, are within Hinsdale County. According to the Lake City and Hinsdale County Community Plan (Hinsdale County 2005), this land is in the agricultural residential cluster, which allows one dwelling per 25 acres. Primary uses include agriculture and ranching, single-family dwellings, churches and places of worship, home occupations, as well as normal and customary accessory uses, bed and breakfasts, outfitters and guides. Larger parcels may also be used for guest ranches and campgrounds.

The remaining private land along the stream corridor is in Archuleta County. According to the Archuleta County Community Plan (Archuleta County 2001), the existing use on this land is mostly agricultural. Along Highway 160 there are other uses, including general commercial, single-family, vacant land, and tribal. The land use code and Archuleta County Community Plan (2001) lists most of the private land in the river

corridor as agricultural ranching with a base density of one dwelling per 35 acres. Land use in the agricultural ranching district is encouraged to provide for the maintenance of agricultural production and preservation of associated lifestyles, with new residential development encouraged to proceed through the rural land use preservation subdivision process. Commercial uses are generally limited to those associated with agricultural uses. Near the junction of the Piedra River with Highway 160 there is a small area classified as agricultural estate. This area has a base density of one dwelling per 5-acre lot to one dwelling per 35-acre lot. Residential development in the agricultural estate district is encouraged to be designed in a way that provides for the preservation and protection of irrigated croplands, rangelands, watershed, and wildlife habitats. Commercial uses are generally limited to home occupations and those associated with non-intensive agricultural operations. This type of development would not interfere with the recreational classification of the river.

#### Potential for conflict with existing and potential land uses



#### Mineral Potential

Upper portions in the wilderness are favorable for epithermal veins. The very upper portion of East Fork has potential for quartz-alunite gold deposits. There has been no development and there is no current production.

Oil and gas potential varies. The lowest portion of the Piedra River is within the Northern San Juan Basin coalbed methane production area (Ignacio-Blanco field), with high potential and current production. From a point approximately 5 miles north of Highway 160 to approximately the forks, there is no oil and gas potential. The Middle Fork and the East Fork then go through a zone of moderate potential and some high to moderate potential within the wilderness. There is no oil and gas production in these areas.

#### Potential for conflict with minerals



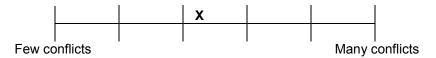
#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 22 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 64.431 cfs. Much of this is in the portion south of Highway 160.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 7 cfs.
- 3. The SWSI report shows four conditional water rights on tributaries of this stream. The CWCB has also mapped a potential reservoir site on the stream and two sites on tributaries, but these have not been verified for feasibility. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

South of the Lower Piedra Campground to the end of the segment at the SJNF boundary, there is occasional riprap on the outside of bends to protect fields and gravel roads from erosion. There are minor amounts of riprap in the developed area around Piedra Campground near the forks. The rest of the section has little if any channel modification.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The Piedra River corridor has 16.8 miles of road concentrated in three areas: 2.5 miles near the forks and the Piedra Picnic ground, 8.0 miles near the First Fork Trailhead and immediately north of Highway 160 by the Lower Piedra Campground, and 3.3 miles south of Highway 160, all of which are maintained for passenger cars. Highway 160 is also located in the river corridor for 0.9 mile. The remaining 2.0 miles of road are portions of side roads not maintained for passenger cars.

In addition to the roads there are also 15.6 miles of trail, the Piedra picnic ground, the First Fork Trailhead, and the Lower Piedra Campground within the river corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

This area has rafting and kayaking of Class IV and V waters through two box canyons. This river also offers exceptionally beautiful and varied wild trout fishing for large fish, and the area is used for hunting, backpacking, horse riding/packing, showshoeing, and skiing.

Other activities that may occur in this area include agriculture and livestock grazing.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

A small portion of the corridor is in the Chimney Rock Archeological Area. Much of the corridor is within the Piedra Area, which was established by the 1993 Colorado Wilderness Act to preserve its wilderness character, but lacks the implied water rights protection of areas designated as wilderness.

The portion of the river north of Highway 160 was also previously recommended for WSR designation.

#### Socioeconomic Environment

The main part of the segment is located in Archuleta County. According to the social and economic assessment completed for the LRMP and captured in sections 3.29, 3.30, and 3.31 of the FEIS, the major part of the economic base in Archuleta County is tourism (37%). This consists mainly of resorts. The second highest segment of the economic base is funds coming in to retirees.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly

increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The portion of the eligible segment of the Piedra River upstream of Highway 160 is determined to be suitable under the Preferred Alternative. This segment was found suitable in previous studies and this most recent review has found ORVs in addition to those leading to that earlier finding of suitable. Portions of the Piedra River receive some protection from the adjacent Piedra Area established in the 1993 Colorado Wilderness Act, but those protections do not extend to the entire segment and, for much of this stream segment, are limited to the western side of the Piedra drainage. There are several instream flows along this portion of the Piedra River, held by the Colorado Water Conservation Board. These flows provide some protection of the ORVs, but would not fully address the identified ORVs.

There are a number of private water rights held on the mainstem and forks of the Piedra River above this segment. Comments heard during the development of the Draft LRMP revision point out a concern for river protections interfering with the continued viability of agricultural in the middle reaches of the Piedra River. The concerns center on whether downstream restrictions that could result from a WSR designation by Congress could inhibit the use of water for agriculture and, thereby, have the unanticipated effect of accelerating the conversion of farms and ranches into housing subdivisions or other uses. Reviewers of the Draft EIS were encouraged to provide additional information to assist in exploring the potential for such unintended consequences should this segment be found suitable in the final analysis.

The portion of the Piedra downstream (south) of Highway 160 was determined not to be suitable. It has higher conflicts with private land and water uses. NFS land only occasionally touches the river. The cultural resources falling on NFS lands in this portion are now highlighted and protected by the Chimney Rock National Monument designation made in 2012.

Comments received on the Draft EIS included concerns that WSR suitability would attract too many visitors, which would result in additional resource impacts; that additional restrictions would be imposed on permitted outfitters; that the portion flowing through private lands on the lower end of the segment should be removed from consideration; that old growth ponderosa pines should be included as an ORV; and that the Piedra Area established through the Colorado Wilderness Act provides sufficient protection.

The Piedra River was first found suitable in 1979. It is not likely that a revised determination of suitability would greatly change patterns or levels of use. Designation, should Congress choose to do so, may increase notoriety and resulting use, but changing demographics and recreational interests are probably bigger factors in predicting use levels. Future management of the river, regardless of WSR designation, would require that attention be paid to excessive use levels.

No specific guidelines are identified in Forest Service Handbook 1909.12 Chapter 80 pertaining to restrictions on permitted outfitters, but the USFS is required to take actions within our authority to protect the identified ORVs. For the portion of the stream segment found suitable, those ORVs are recreation, scenery, and geology. Scenery and geology would not be protected through restrictions on outfitters. The recreation ORV highlighted whitewater boating and fishing, both of which can be enhanced by the services provided by outfitters.

The portion of the study segment below Highway 160 that contains a great percentage of private land has not been found suitable.

Old growth ponderosa pine along the Piedra River undoubtedly adds to the scenery component, but is not itself dependent on the presence of the river and has not been added as an ORV.

The Piedra Area provides for protection of the wilderness characteristics of 61,850 acres. Some of this area includes the Piedra River and would indeed provide certain protections for the identified ORVs.

However, only a portion of the study segment falls within the Piedra Area, with much of the remainder falling adjacent to the designated Piedra Area.

WSR designation for portions of the Piedra River is determined to be the best form of protection of both the ORVs and the stream's free-flowing character. Past suitability study of the Piedra River reached the same conclusion and the review presented in the Draft EIS and here found additional ORVs to be considered. Existence of the Piedra Area designation under the Colorado Wilderness Act of 1993 does provide some protection from large dam construction, but does not fully protect the ORVs or the free-flowing character of the stream because portions of the river could still be subject to large-scale water diversions.

A community-based Piedra River Workgroup was formed in October 2011 to consider potential river protections and alternatives to WSR designation. At the time of writing this analysis, the Piedra River Workgroup has not yet finished its review nor published a report. When the workgroup publishes a summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### East Fork Piedra River

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from the headwaters to its confluence with the Middle Fork Piedra River. The entire stream was found eligible. The total length of river studied and found eligible was 16.54 miles. Within the wilderness the East Fork was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

Below the wilderness the stream is over-appropriated, causing lower flows.

**Wild and Scenic Classification:** The stream classification is split between wild and recreation (Table D.51). The upper section, within the wilderness, is classified as wild because it can only be accessed by trail. The lower portion is classified as recreation due to the roads along both sides of the stream making it readily accessible.

Table D.51: Miles by Classification

Wild	Scenic	Recreation	Total
9.37	0	7.16	16.53

**Land Ownership:** Land ownership is split between NFS and private land. Table D.52 is a breakdown of land ownership along this segment in river miles.

Table D.52: Miles by Ownership

NFS	Private	Total	% NFS
12.25	4.29	16.54	74.1%

Table D.53 is a breakdown of the ownership within the river corridor in acres.

Table D.53: Acres by Ownership

NFS	Private	Total	% NFS
3,668.70	1,023.89	4,692.59	78.2%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

The East Fork was previously studied and recommended for WSR designation. The ORVs determined in the 1979 study were scenery, recreation, and geology. Inclusion of part of the river in the Weminuche wilderness and the management of the remainder in a 10D management area (WSR management) under the previous LRMP have maintained those values.

**Fish:** In addition, the current study also identified a fishery ORV. This stream is one of 12 sites within the SJNF that contain genetically pure strains of Colorado River cutthroat trout, and thus is an important producer of resident fish species and is of particular significance because of the presence of wild stocks. Colorado River cutthroat trout are a species of special concern because they are a sensitive native species and qualify as wild stocks and/or federal or state listed or candidate threatened, endangered, or sensitive species. The species is on the USFS sensitive species list and is considered by CPW as a species of special concern. Under the Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming(Tri-State Agreement), the State of Colorado has agreed to the goal of establishing two self-sustaining meta-populations, each consisting of five separate, viable but interconnected sub-populations, in each GMU within the historic range. The San Juan watershed is one of 14 GMUs in the Tri-State Agreement. The East Fork of the Piedra River was selected as one of our two best cutthroat fisheries in the San Juan watershed (along with the Hermosa) with pure genetics to accomplish this goal.

**Scenery:** The stream segment is also listed as eligible for scenery based on the impressive waterfalls along the stream.

#### **Existing and Potential Land Uses**

After a short portion near the forks that are in a recreation management corridor, the East Fork is in an area of natural landscapes with limited management, and then enters the Weminuche wilderness. This is compatible with the scenery and fisheries ORVs.

Approximately 2.4 miles of the stream channel, accounting for 733 acres of private land, are within Hinsdale County. According to the Lake City and Hinsdale County Community Plan (Hinsdale County 2005) this land is in the agricultural residential cluster, which allows one dwelling per 25 acres. Primary uses include agriculture and ranching, single-family dwellings, churches and places of worship, home occupations, as well as normal and customary accessory uses, bed and breakfasts, outfitters and guides. Larger parcels may also be used for guest ranches and campgrounds. These uses would not interfere with the recreational classification of the river. The remainder of the private land is within Mineral County, which does not have a land use plan.

#### Potential for conflict with existing and potential land uses

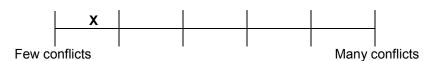


#### Mineral Potential

Upper portions in the wilderness are favorable for epithermal veins. The very upper portion of East Fork has potential for quartz-alunite gold deposits. There has been no development and there is no current production.

The East Fork is in a zone of oil and gas moderate potential and some high to moderate potential within the wilderness. There is no oil and gas production in these areas.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists nine diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 50 cfs. Below the wilderness the stream is over-appropriated.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 50 cfs.
- 3. The SWSI report shows one conditional water right in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There may be minor sections of riprap associated with these diversions, and with road crossings and protection of fields on the outside of some bends on private land. There has been river restoration work with rocks and logs on the upstream-most private land. These do not detract from the free-flowing character of the river

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The river corridor of the East Fork Piedra River has 3.0 miles of road, 2.2 of which are maintained for passenger cars. There are also 3.9 miles of trail.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

Recreation uses are predominantly hiking, camping, fishing, hunting, backpacking, horse riding/packing, and snowmobiling. There has been timber harvest in the area. Other activities in the area consist of agriculture, livestock grazing, and potential for mining and oil and gas production.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

Most of the stream is within the Weminuche wilderness.

#### Socioeconomic Environment

The majority of the private land in the East Fork is in Hinsdale County. According to the Lake City and Hinsdale County Community Plan (2005), Hinsdale County encompasses 1,118 square miles. Hinsdale is one of the least-populated counties in Colorado and the 15th-lowest in the nation, with less than one person (0.7) per square mile—96% of its acreage is public land, 46% of which is wilderness. The majority of county residents live in Lake City or within a 15-mile radius. The county was built on mining, ranching, and recreation.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The portion of the East Fork River upstream of the Weminuche wilderness boundary is found suitable under the Preferred Alternative. This stream segment was included in earlier findings of suitability for the ORVs of scenery, recreation, and geology. Those ORVs remain intact. This updated review finds that an additional ORV of outstanding Colorado River Cutthroat trout fishery exists. While there are a number of streams in southwest Colorado containing pure strains of the Colorado River cutthroat trout, the East Fork of the Piedra River and Hermosa Creek, found suitable under the discussion above, have been found to be the best native trout fisheries and are very important to the long-term conservation of the species in this part of the trout's range. Wilderness designation does provide a great deal of protection for this stream segment, particularly for the scenery, recreation, and geology aspects, but WSR designation could provide additional protections of the stream's free-flowing character and would add focus to maintaining the Colorado River cutthroat fishery.

The segment found suitable is limited to the East Fork of the Piedra River upstream of the Weminuche wilderness boundary due to private ownership downstream of this boundary and the intense agricultural use of water—and substantial seasonal dewatering of the stream—between the wilderness boundary and the downstream confluence with the Middle Fork of the Piedra.

Comments on the Draft EIS specific to the East Fork of the Piedra River expressed concerns with attracting more visitors. Please see the response provided for the mainstem of the Piedra presented above.

A community-based Piedra River Workgroup was formed in October 2011 to consider potential river protections and alternatives to WSR designation. At the time of writing this analysis, the workgroup has not yet finished its review nor published a report. When the workgroup publishes a summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Middle Fork Piedra River

**Location:** The stream was studied from its headwaters to its confluence with the East Fork Piedra River. The entire stream was found eligible. The total length of river studied and found eligible was 18.75 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** The stream classification is split between wild and recreation (Table D.54). The upper section, within the wilderness, is classified as wild because it can only be accessed by trail. The lower portion is classified as recreation due to the NFS road along the stream making it readily accessible.

Table D.54: Miles by Classification

Wild	Scenic	Recreation	Total
11.75	0	7.03	18.77

**Land Ownership:** Land ownership is split between NFS and private land. Table D.55 is a breakdown of land ownership along this segment in river miles.

**Table D.55: Miles by Ownership** 

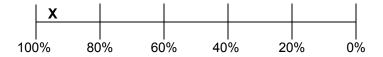
NFS	Private	Total	% NFS
17.93	0.84	18.77	95.5%

Table D.56 is a breakdown of the ownership within the river corridor in acres.

Table D.56: Acres by Ownership

NFS	Private	Total	% NFS
5,218.70	235.22	5,453.92	95.7%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

The Middle Fork was previously studied and recommended for WSR designation. The ORVs determined in the 1979 study were scenery, recreation, and geology. Inclusion of part of the river in the Weminuche wilderness, and the management of the remainder in a 10D management area (WSR management) in the previous LRMP has maintained those values.

#### **Existing and Potential Land Uses**

After a short portion near the forks managed as a recreation corridor, the Middle Fork of the Piedra River is in an area of natural landscapes with limited management. Then it enters the Weminuche wilderness. This is compatible with the scenery, geology, and recreation ORVs.

The small amount of private land is within Hinsdale County. According to the Lake City and Hinsdale County Community Plan (2005), this land is in the agricultural residential cluster, which allows one dwelling per 25 acres. Primary uses include agriculture and ranching, single-family dwellings, churches and places of worship, home occupations, as well as normal and customary accessory uses, bed and breakfasts, outfitters and guides. Larger parcels may also be used for guest ranches and campgrounds. These uses would not interfere with the recreational classification of the river.

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

Upper portions in the wilderness are favorable for epithermal veins. The very upper portion of East Fork has potential for quartz-alunite gold deposits. There has been no development and there is no current production.

Oil and gas potential varies. The Middle Fork goes through a zone of moderate potential and some high to moderate potential within the wilderness. There is no oil and gas production in these areas.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists five diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 20.75 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows no conditional water rights.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There may be minor sections of riprap associates with diversions, and with road crossings, but these do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development

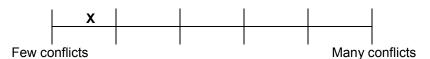


#### **Transportation and Facilities**

There are 5.1 miles of road that are maintained for passenger cars and 5.2 miles of road that are not maintained for passenger cars, as well as 5.0 miles of trail within the river corridor. The Middle Fork Trailhead and a recreation residence are in the corridor.

On the private lands, there could be additional development of agriculture, including irrigation structures, grazing, and roads.

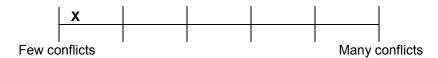
#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

Recreation uses are predominantly camping, fishing, hunting, backpacking, horse riding/packing, snowmobiling, and skiing. Other activities in the area consist of agriculture, livestock grazing, timber harvest, and potential for mining and oil and gas production.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

Most of the stream is within the Weminuche wilderness. This river was also previously recommended for WSR designation.

#### Socioeconomic Environment

According to the Lake City and Hinsdale County Community Plan (2005), Hinsdale County encompasses 1,118 square miles. Hinsdale is one of the least populated counties in Colorado and the 15th-lowest in the nation, with less than one person (0.7) per square mile—96% of its acreage is public land, 46% of which is wilderness. The majority of county residents live in Lake City or within a 15-mile radius. The county was built on mining, ranching, and recreation.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

## Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The Middle Fork of the Piedra River is found suitable for inclusion in the National Wild and Scenic Rivers System under the Preferred Alternative. This reach of river was also found suitable in previous studies in recognition of the scenery, recreation, and geology ORVs. These ORVs remain. The segment found suitable extends from the boundary of NFS lands upstream of the confluence with the East Fork, to the headwaters of the river, and includes area both inside and outside the Weminuche wilderness. While the Middle Fork does not contain the ORV of Colorado River cutthroat trout (unlike the East Fork of the Piedra), the ORVs of scenery, recreation, and geology do not receive the protections of designated wilderness along a sizeable portion of the stream reach. WSR protections, therefore, would add a significant level of protection for the ORVs and the free-flowing character of the stream.

Comments received on the Draft EIS specific to the Middle Fork of the Piedra River expressed concerns with attracting additional visitors, restrictions placed on livestock grazing permits, hindering releases for instream flows to benefit habitat, and impacts on agricultural water users. Please see the discussion for the mainstem of the Piedra for responses to increased visitation.

For segments classified as wild, Forest Service Handbook 1909.12 Chapter 80 states: "Domestic livestock grazing should be managed to protect identified river values. Existing structures may be maintained. New facilities may be developed to facilitate livestock management so long as they maintain the values for which a river was found eligible or suitable, including the area's essentially primitive character." For segments classified as recreational, the guidance states: "Domestic livestock grazing should be managed to protect identified river values. Existing structures may be maintained. New facilities may be developed to facilitate livestock management so long as they maintain the values for which a river was found eligible or suitable."

There are no known conflicts between WSR suitability and the ability to provide for instream flows to support habitat. If designated, there would be a federal reserved right junior to existing rights. This federal reserved right itself would be to protect the ORVs, which include fishing; this right should be consistent with purpose of maintaining habitat. Agricultural water uses downstream of a federal reserved water right should benefit by protected flows. The analysis presented here, and the accompanying FEIS, acknowledge the concern for interactions between federal reserved rights and senior water rights when changes to those senior rights are proposed.

A community-based Piedra River Workgroup was formed in October 2011 to consider potential river protections and alternatives to WSR designation. At the time of writing this analysis, the workgroup has not yet finished its review nor published a report. When the Piedra River Workgroup publishes a

summary report, it would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Suitability Determination

Miles found suitable by classification are provided in Table D.57 and are illustrated on Figure D-5 Piedra River and Tributaries.

**Table D.57: Miles Found Suitable** 

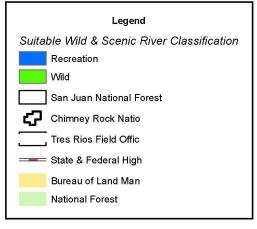
	Wild	Scenic	Recreation	Total
East Fork Piedra River-North of wilderness boundary	9.4	0	0	9.4
Middle Fork Piedra River	11.7	0	7.6	19.3
Piedra River-North of Highway 160 to forks	14.1	0	8	22.1
Piedra River Totals	35.2	0	15.6	50.8
* Segments adjusted to exclude roads from wild segments.				

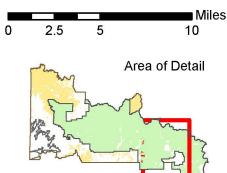
#### **Outstanding Issues and Conflicts to be Resolved**

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

## Wild and Scenic Rivers Piedra River and Tributaries San Juan National Forest

San Juan National Forest and Tres Rios Field Office Figure D-5

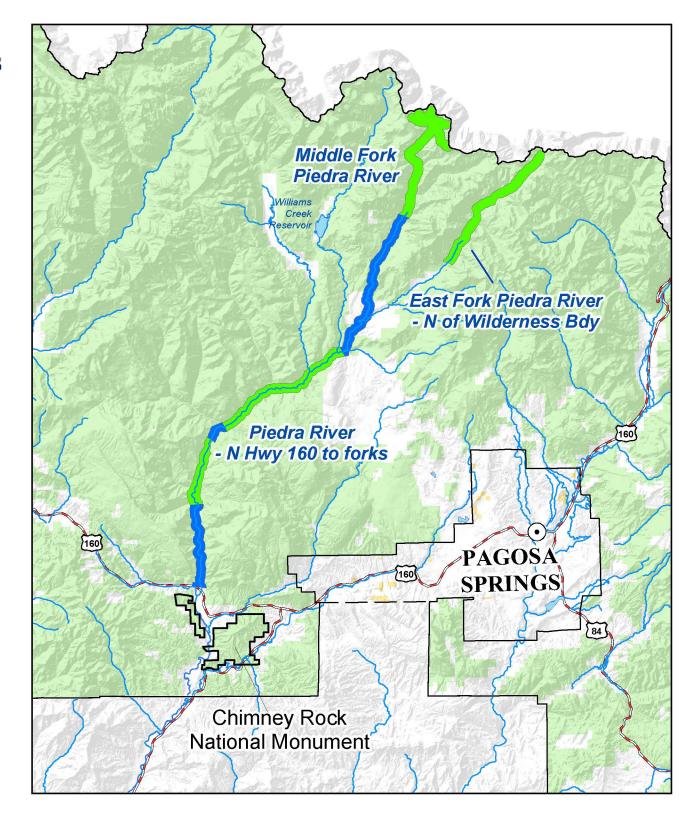




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#### San Juan River System

Eligible portions of the San Juan River and tributaries, and their classification, are as follows. Details for each segment are below (Table D.58).

**Table D.58: Miles per Eligible Segments** 

	Wild	Scenic	Recreation	Total
West Fork of the San Juan River	8.60	0	8.70	17.30
Wolf Creek and Falls Creek	0	0	7.75	7.75
East Fork of the San Juan River	0	0	13.12	13.12
San Juan Totals	8.60	0	29.57	38.17

#### West Fork of the San Juan River

**Location:** The stream was studied from its headwaters to its confluence with the East Fork of the San Juan River, where they combine to form the San Juan River. The entire stream was found eligible. The total length of river studied and found eligible was 17.29 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This segment is split between a wild and a recreation classification (Table D.59). The breakdown of the number of miles in each category can be seen in the following table. The upper portion of the stream is classified as wild because it is located in the Weminuche wilderness and can only be accessed by trail. The lower section of the stream is classified as recreation due to the presence of a road along most of this segment and a designated campground along the stream.

Table D.59: Miles by Classification

Wild	Scenic	Recreation	Total
8.60	0.00	8.70	17.30

**Land Ownership:** Land ownership is split between National Forest and private land. Table D.60 is a breakdown of land ownership along this segment in river miles.

**Table D.60: Miles by Ownership** 

NFS	Private	Total	% NFS
10.67	6.62	17.29	61.7%

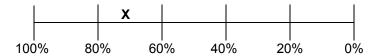
Table D.61 is a breakdown of the ownership within the river corridor in acres.

Table D.61: Acres by Ownership

NFS	Private	Total	% NFS
3,440.99	1,784.74	5,225.73	65.8%

The private lands are concentrated in the lower 4 miles of the corridor. In this portion, the NFS lands are small slivers that do not touch the stream

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Geology:** The West Fork of the San Juan River has geological significance. The river has carved through a complex of Tertiary Oligocene pyroclastics (ash flows, tuffs and lava flows) emplaced during the creation of the San Juan volcanic field, a time of possibly the most violent volcanic explosions (caldera eruptions) of the last 4 billion years. Erosion by the river has left on the valley side walls exposures of massive layers of pyroclastics and volcaniclastics that are "textbook" cross sections of the distal zones of the San Juan volcanic field in Colorado. Also in the river valley, the post-glacial failure of support in the volcanic cliff walls has generated massive ongoing landslides, classic examples of slope failure, gravity slumping, and colluvial movement, hosting outstanding groves of aspen that thrive on such disturbed ground. Recreational driving and hiking benefit from the colorful exposures of volcanic ash, which rival those of Yellowstone National Park's Little Grand Canyon.

#### **Existing and potential land uses**

The West Fork of the San Juan River is mostly within the Weminuche wilderness. The lower portion is within a recreation management area. This is compatible with the geologic ORV.

Approximately 1.9 miles of the stream channel, accounting for 450 acres of private land, are within Archuleta County. According to the Archuleta County Community Plan (Archuleta County 2001), the existing use on this land is agricultural and the future land use code lists the area as very low-density residential. The base density in this area is 35 acres per dwelling. This type of development would not interfere with the recreational classification of the river. The remainder of the private land is within Mineral County, which does not have a land use plan.

#### Potential for conflict with existing and potential land uses

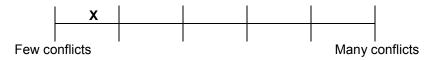


#### **Mineral Potential**

The upper portion in the wilderness is favorable for epithermal veins of locatable minerals. There has been no development and there is no current production.

The river flows through an area of high to moderate oil and gas potential. There is no current production in this area.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 29 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 127.355 cfs.
- The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 103.15 cfs and 35,797 acre-feet. One of the reservoir sites could inundate NFS lands. Most of the other water rights are on private land in the lower 4 miles of the corridor, where NFS lands seldom touch the river
- 3. The SWSI report shows one conditional water right in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There may be minor sections of riprap associated with these diversions, and with road crossings and protection of fields on the outside of some bends on private land, but these do not detract from the free-flowing character of the river.

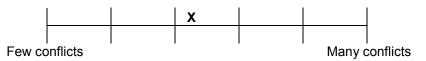
#### Potential for conflict with water resources development



#### **Transportation and Facilities**

Highway 160 is within the river corridor for 3 miles. There are an additional 2.9 miles of road maintained for passenger cars and 1.1 miles of road not maintained for passenger cars within the river corridor. There are also 11.1 miles of trail. The West Fork Campground and three recreation residences are in the river corridor.

#### Potential for conflict with transportation and facilities



#### **Recreation and Other Resource Activities**

There is one developed campground in the area. Hiking, camping, backpacking, horse riding/packing, skiing, and using hot springs are popular.

Other activities that may occur include agriculture, mining, and livestock grazing.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

The upper portion of the stream is within the Weminuche wilderness.

#### Socioeconomic Environment

An economic study was not conducted for Mineral County, so statistics comparable to those quoted for other counties are not readily available.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

### Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The portion of the West Fork of the San Juan River upstream of where the river enters a large continuous block of private lands, immediately downstream of the USFS West Fork Campground, is found suitable

for designation under the WSRA in the Preferred Alternative. The determination of suitability is based on the ORV of geology, which in turn lends to the scenic and recreational value of the area. The geology of the West Fork of the San Juan corridor stands out because of the way in which it displays the variety of formative influences resulting in the San Juan Mountain range. WSR designation is determined to be the best form of protection of the ORV and free-flowing character of this stream segment.

This determination of suitability differs from the preliminary finding presented in the Draft EIS by removing the private land segment downstream of NFS lands. This would result in the inclusion of slightly more than 0.5 mile of suitable river crossing private lands near Born Lake, removing about 6.0 miles from the river mileage determined to be suitable. The downstream terminus of the suitable reach is now the boundary of NFS lands immediately downstream of the USFS West Fork Campground. This change was made in response to comments on the Draft EIS that raised concerns regarding potential impacts to private lands and rights. The Draft EIS noted the potential conflicts with private lands and expressly asked for comments on this issue. Comments were received on this topic citing concerns for impacts to private rights and that much of the private land is already protected through conservation easements. As a result, most of the private portion of the studied segment has been removed from the suitability determination. The result of this adjustment is that some of the diversity of the identified geology ORV would not be protected, but public comments on the Draft EIS highlighted that existing conservation easements on much of the private land on the lower portion of the study reach was already protected from major changes in land use through existing conservation easements, affording substantial protection to the ORV.

The San Juan River Workgroup was initiated in February 2010 and resulted in a report published in July 2011. This effort was conducted outside the USFS's WSR review process but initiated, in part, in response to the findings presented in the Draft EIS. The workgroup and its report focused on potential management actions for both the West Fork and East Fork of the San Juan River. The final report of the workgroup was not completed prior to the close of the comment period for the Draft EIS and could not be fully addressed here. It does, however, include a number of findings and suggestions that could assist federal, state, and local governments, as well as private landowners, in future management of the river and surrounding watershed.

The final report of the San Juan River Workgroup would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Wolf Creek and Falls Creek

**Location:** This is a branched segment that includes Wolf Creek from approximately 2 miles below Wolf Creek Pass to the confluence with the West Fork of the San Juan River, plus small portions of Falls Creek and Lake Creek to encompass the waterfalls. The entire segment was found eligible. The total length of river studied and found eligible was 7.75 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** This entire stream segment is a recreational classification. This classification is based on the fact that Highway 160 follows the stream for the length of the segment. There is also a designated camparound near the lower end of the segment.

**Land Ownership:** Land ownership is split between NFS and private land. Table D.62 is a breakdown of land ownership along this segment in river miles.

Table D.62: Miles by Ownership

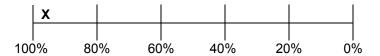
NFS	Private	Total	% NFS
7.21	0.55	7.76	92.9%

Table D.63 is a breakdown of the ownership within the river corridor in acres.

Table D.63: Acres by Ownership

NFS	Private	Total	% NFS
2,231.44	137.87	2,369.31	94.2%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

**Wildlife:** Wolf Creek and Falls Creek contain five waterfalls occupied by black swifts, a bird that is vulnerable in Colorado. The black swift worldwide breeding distribution is limited to a narrow portion of the Rocky Mountains from Mexico to British Columbia, and a narrow band along sea cliffs overlooking the Pacific coast from California to Alaska. The black swift builds nests only at waterfalls. The nests are made of moss and require mist from the waterfall to remain intact. The SJNF provides a significant contribution to the species' worldwide breeding distribution by providing a core breeding population and by providing critical connectivity within the southern Rocky Mountains portion of its range. Of the 10 streams studied on the SJNF that have black swift nest sites, three were chosen as outstandingly remarkable because they contained the best clusters of nests.

**Scenery:** Treasure Falls is also located in the segment on Falls Creek. This waterfall is just off Highway 160 and is one of the easiest waterfalls to visit within the planning area. Due to its proximity to the highway it is visited by people from all over the world.

#### **Existing and Potential Land Uses**

These streams are mostly within the recreation management corridor along Highway 160. The small portion that is outside is a management where natural processes dominate. This is compatible with the wildlife and scenery ORVs.

There is a small amount of private land in Mineral County, and a land use plan is not available

#### Potential for conflict with existing and potential land uses



#### **Mineral Potential**

There is no production or potential for locatable minerals.

The river flows through an area of high to moderate oil and gas potential. There is no current production in this area.

#### Potential for conflict with minerals



#### **Water Resources Development**

Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists four diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 2.68 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 3.07 cfs.
- 3. The SWSI report shows no conditional water rights in this stream. None of the future projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river.

There may be minor sections of riprap associated with road crossings and protection of Treasure Falls parking lot, but these do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

There are 11.8 miles of road within the river corridor. Highway 160, a paved three-lane highway, contributes 6.4 miles, most of which are on the valley side slope and not immediately adjacent to the stream; 2.6 miles are gravel roads and the remaining 3.8 miles are dirt roads not suitable to passenger cars.

Treasure Falls has a 0.2-mile hiking trail and a roadside rest area. The Wolf Creek Campground is also within the river corridor but has been closed.

#### Potential for conflict with transportation and facilities

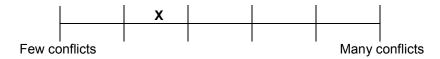


#### **Recreation and Other Resource Activities**

The recreational activities in this area include camping, hiking, hunting, backpacking, horse riding/packing, skiing, snowmobiling, ice climbing, and scenic driving along Highway 160. Wolf Creek ski area is just over the Continental Divide.

Other activities that may occur in the area include livestock grazing and oil and gas development.

#### Potential for conflict with recreation and other resources



#### **Special Areas**

There is a small portion of Lake Creek within the Weminuche wilderness.

#### Socioeconomic Environment

An economic study was not conducted for Mineral County, so statistics comparable to those quoted for other counties are not readily available.

Wolf Creek ski area is a major economic draw for the communities of Pagosa Springs and South Fork.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

Wolf Creek and Fall Creek are not found suitable under the Preferred Alternative. Two ORVs, wildlife and scenery, were identified in the development of this LRMP. The wildlife ORV pertains to the existence of black swift nests. Elsewhere in the unit under this plan, streams containing black swift nests have been found suitable. The quality of black swift nesting habitat along Wolf Creek and Fall Creek justifies protection, but adequate protection can be achieved under the recreation management corridor identified under the Preferred Alternative and through other means such as securing sufficient flows to protect the waterfalls and swift nesting sites under the Colorado instream flow program. Likewise, the scenery ORV can readily be protected through the recreation management corridor proposed under the Preferred Alternative.

Comments received on Wolf Creek and Falls Creek opposed designation due to concerns for private property rights, potential increased use of the area, the desire to preserve potential reservoir sites, and questions regarding water quality on portions of the segment.

#### East Fork of the San Juan River

**Location:** The stream and associated corridor (0.25 mile on either side) was studied from where it became a third-order stream to its confluence with the West Fork of the San Juan River, where they combine to form the San Juan River. The entire stream was found eligible. The total length of river studied and found eligible was 13.12 miles. The segment was determined to be sufficiently free-flowing and to possess sufficient water quality to support the ORVs.

**Wild and Scenic Classification:** The entire stream has a recreation classification. There are roads that closely follow the entire length of the stream making it readily accessible.

**Land Ownership:** Land ownership is split between NFS and private land. Table D.64 is a breakdown of land ownership along this segment in river miles.

Table D.64: Miles by Ownership

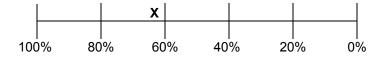
NFS	Private	Total	% NFS
7.28	5.84	13.12	55.5%

Table D.65 is a breakdown of the ownership within the river corridor in acres.

Table D.65: Acres by Ownership

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	NFS	Private	Total	% NFS
	2,412.77	1,376.68	3,789.45	63.7%

#### Amount of federally owned land within the river corridor



#### **Outstandingly Remarkable Values**

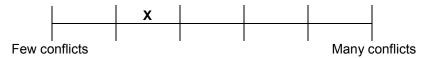
**Geology:** This stream is a "textbook" example in the San Juan Mountains of a multiple advance-and-retreat alpine glacial-fluvial system in a setting of recent volcanic geology, ranging from sculpted headwaters through glaciated valley to narrow outwash canyons. There are abundant post-glacial features, including braided stream system, terminal and lateral moraines, the dramatic "gateway" entrance to the glacial valley, hanging valleys, and waterfalls. The entire reach of the river is a document of the most recent planetary glacial age, which may not yet be over, through geologic terrain that was fresh when the glaciation began and has been little altered since it ended, a valuable "classroom" for study of a phenomenon of planetary importance that is poorly understood today. The valley's dramatic glaciated and floodwater-carved landscapes have attracted recreational use and development proposals since the settlement of this part of the state.

#### **Existing and Potential Land Uses**

This stream is mostly within a recreation management corridor. The upper one-third that is on NFS land would be managed for natural landscape with limited management. This is compatible with the geologic ORV.

Approximately 0.5 mile of the stream channel, accounting for 204 acres of private land, is within Archuleta County. According to the Archuleta County Community Plan (Archuleta County 2001) the existing use on this land is agricultural; the future land use code lists the area as very low-density residential. The base density in this area is 35 acres per dwelling. This type of development would not interfere with the recreational classification of the river. The remainder of the private land is within Mineral County, which does not have a land use plan.

#### Potential for conflict with existing and potential land uses

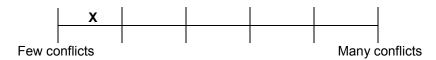


#### **Mineral Potential**

Upper terminus is close to an area favorable for stockwork molybdenum and porphyry-copper molybdenum, and the upper portion is in an area favorable for epithermal veins. There had been historic exploration, but there is no current production.

The river flows through an area of high to moderate oil and gas potential. There is no current production in this area.

#### Potential for conflict with minerals



#### **Water Resources Development**

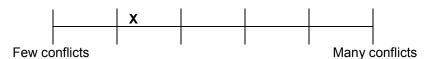
Three sources were used to describe existing and possible future water resources development:

- 1. The State of Colorado Water Rights Database (HydroBase) lists 10 diversions in the corridor of this stream. For those with decreed capacity listed, the total diversion is 15.313 cfs.
- 2. The Colorado Division of Water Resources Division 7 Engineer shows conditional water rights totaling 158.35 cfs and 35,706 acre-feet, some of which may be abandoned or expired.
- 3. The SWSI report shows two conditional water rights in this stream. The CWCB has also mapped two potential reservoir sites, but these have not been verified for feasibility. None of the future

projects listed in SWSI Section 6 (Identified Projects and Processes) impact this river. The Dry Gulch reservoir site is several miles downstream.

Portions of East Fork Road 667 have road fill that borders and encroaches on the stream. There are minor sections of riprap associated with road crossings. Bioengineered stream habitat and stability work on the private land have made some channel changes. These do not detract from the free-flowing character of the river.

#### Potential for conflict with water resources development



#### **Transportation and Facilities**

The East Fork of the San Juan River corridor contains 11.3 miles of gravel road and 0.9 mile of four-wheel-drive road. There are also 2.6 miles of trail and 7.6 miles of winter trail (road groomed for skiing or snowmobiling). The East Fork Campground and Silver Falls guard station are located within the river corridor.

#### Potential for conflict with transportation and facilities

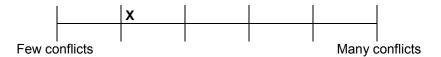


#### **Recreation and Other Resource Activities**

Recreational opportunities within this area include camping, hiking, hunting, backpacking, horse riding/packing, rafting, kayaking, four-wheel-drive driving, ATV driving, skiing, and snowmobiling.

Other activities that may occur in this area include agriculture, livestock grazing, mining, and oil and gas development.

#### Potential for conflict with recreation and other resources



#### Socioeconomic Environment

An economic study was not conducted for Mineral County, so statistics comparable to those quoted for other counties are not readily available.

#### **Current Administration and Funding Needs**

Finding this stream suitable for WSR designation would not dramatically change the use or management in this area; therefore, the costs associated with the management of this river segment would not greatly increase. If Congress or the Secretary of the Interior were to designate this as a WSR, the increased attention and public presence might increase management costs.

# Benefits and Impacts of Wild and Scenic and Other Methods and Suitability Determination

The East Fork of the San Juan contains the ORV of geology and, like the West Fork of the San Juan, presents tremendous examples of the factors leading to the formation and subsequent alterations of the San Juan Mountains. The East Fork is found to be suitable for designation under the Preferred Alternative, from where it becomes a third order stream downstream to the boundary of NFS lands near the USFS East Fork Campground. This represents a change from the preliminary finding of not suitable presented in the Draft EIS and slightly shortens the study segment by removing consideration of private lands near the confluence with the West Fork of the San Juan River. Comments received on the Draft EIS noted that conservation easements were being prepared for the block of private lands in the middle portion of the reach, and that some of the water rights had been abandoned, thereby removing some of the private property conflicts. Adjusting the downstream terminus to the boundary of NFS lands further reduces private land conflicts.

Comments were also received supporting inclusion of the East Fork in our suitability findings due to the outstanding opportunities to observe geologic features, the related educational benefits, and how WSR suitability could complement the nearby South San Juan wilderness. A comment was also provided that cited that the East Fork was not found eligible in past reviews, but did not provide any evidence that the findings of eligibility in this appendix were inaccurate.

Based on the analysis presented in the Draft EIS and comments received on the preliminary finding and rationale, WSR designation is determined to be the best form of enduring protection of the ORV and free-flowing character of the stream.

The San Juan River Workgroup was initiated in February 2010 and resulted in a report published in July 2011. This effort was conducted outside the USFS's WSR review process but initiated, in part, in response to the findings presented in the Draft EIS. The workgroup and its report focused on potential management actions for both the West Fork and East Fork of the San Juan River. The final report of the workgroup was not completed prior to the close of the comment period for the Draft EIS and could not be fully addressed here. It does, however, include a number of findings and suggestions that could assist federal, state, and local governments, as well as private landowners, in future management of the river and surrounding watershed.

The final report of the San Juan River Workgroup would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

#### Suitability Determination

Miles found suitable by classification are provided in Table D.66 and are illustrated on Figures D-6 West Fork of the San Juan River and Tributaries and D-7 East Fork San Juan River and Tributaries.

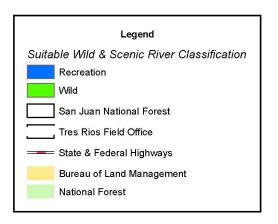
Table D.66: Miles Found Suitable

	Wild	Scenic	Recreation	Total
West Fork of the San Juan River	8.60	0	0	8.6
Wolf Creek and Falls Creek	0	0	0	0
East Fork of the San Juan River	0	0	13.2	13.2
San Juan Totals	8.60	0	13.2	21.8

#### Outstanding Issues and Conflicts to be Resolved

The Southwest Basin Roundtable continues to prepare a needs assessment and to identify potential water projects as directed by Colorado H.B. 05-1177. Reports of this roundtable would be made available as additional information to be reviewed if the WSR recommendation is made to Congress.

# Wild and Scenic Rivers West Fork San Juan River San Juan National Forest and Tres Rios Field Office Figure D-6

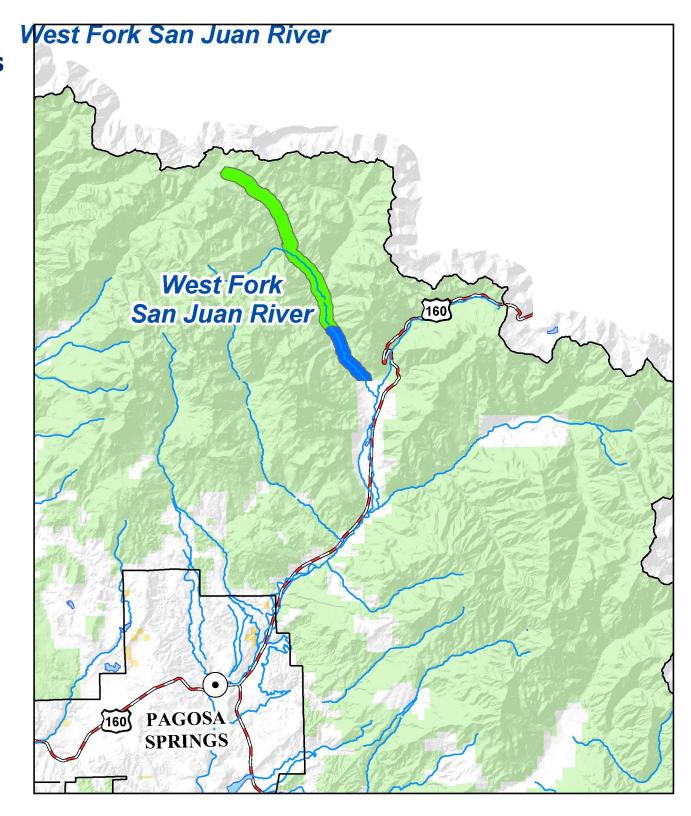




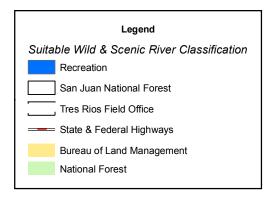


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MDR NAD 83, Polyconic Projection May 30, 2013



# Wild and Scenic Rivers East Fork San Juan River San Juan National Forest and Tres Rios Field Office Figure D-7



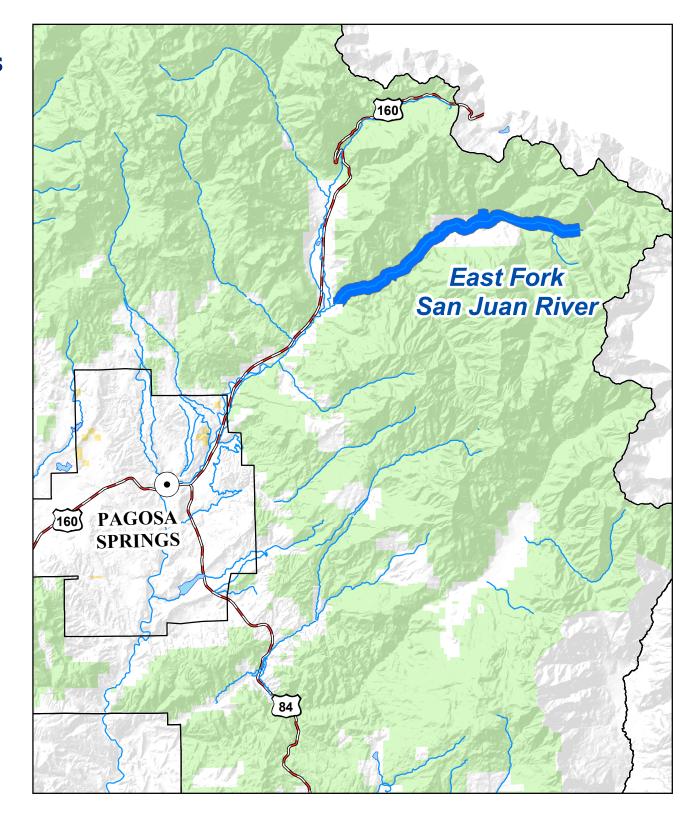




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#### WILD AND SCENIC RIVER ANALYSIS

### List of Streams Initially Evaluated for Eligibility

The WSRs analysis considered primarily third-order and larger streams located on the SJNF and TRFO. Some smaller order streams for which subject matter experts identified a potential ORV were added.

Table D.67 lists all the streams that were evaluated. This WSR suitability appendix describes the results of this evaluation.

Table D.67: All Streams Evaluated

4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs
River Watershed Name	
Upper Dolores River	Barlow Creek
Upper Dolores River	Bean Canyon
Upper Dolores River	Bear Creek
Upper Dolores River	Beaver Creek
Upper Dolores River	Bell Creek
Upper Dolores River	Big Canyon
Upper Dolores River	Big Canyon
Upper Dolores River	Big Gypsum Creek
Upper Dolores River	Big Spring Gulch
Upper Dolores River	Boggy Draw
Upper Dolores River	Bull Canyon
Upper Dolores River	Cabin Canyon
Upper Dolores River	Canyon Creek
Upper Dolores River	Calf Creek
Upper Dolores River	Carver Canyon
Upper Dolores River	Chicken Aspen Canyon
Upper Dolores River	Clear Creek
Upper Dolores River	Cottonwood Creek
Upper Dolores River	Coyote Wash
Upper Dolores River	Dawson Draw
Upper Dolores River	Dawson Draw Canyon East
Upper Dolores River	Desert Claim Arroyo
Upper Dolores River	Disappointment Creek
Upper Dolores River	Disappointment Creek, upper
Upper Dolores River	Dolores River (McPhee Dam to Taylor)
Upper Dolores River	Dolores River, above Taylor
Upper Dolores River	Dolores River, Big Gypsum to La Sal Cr
Upper Dolores River	Dolores River, La Sal Cr to Bedrock
Upper Dolores River	Dolores River, McPhee Res to Disappointment
Upper Dolores River	Dolores River, Disappointment to Big Gypsum
Upper Dolores River	Dry Canyon
Upper Dolores River	East Branch Pine Arroyo
Upper Dolores River	East Paradox Creek
Upper Dolores River	Far Draw
Upper Dolores River	Ferris Canyon
Upper Dolores River Fish Creek	
Upper Dolores River	Doe Canyon
Upper Dolores River	Glade Canyon
Upper Dolores River	Glade Point Canyon
Upper Dolores River	Hop Creek

4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs
River Watershed Name	
Upper Dolores River	Horse Creek
Upper Dolores River	Falls Creek
Upper Dolores River	Hunt Creek
Upper Dolores River	Indian Valley
Upper Dolores River	Johnny Bull Creek
Upper Dolores River	Leach Creek
Upper Dolores River	Lion Creek
Upper Dolores River	Little Gypsum Creek
Upper Dolores River	Long Draw
Upper Dolores River	(tributary to Plateau)
Upper Dolores River	(tributary to Beaver)
Upper Dolores River	Lost Canyon
Upper Dolores River	Marguerite Creek
Upper Dolores River	Mavreeso Creek
Upper Dolores River	May Canyon
Upper Dolores River	McIntyre Canyon
Upper Dolores River	McJunkin Creek
Upper Dolores River	McKinney Draw
Upper Dolores River	Morgan Gulch
Upper Dolores River	Morrison Creek
Upper Dolores River	Narraguinnep Canyon
Upper Dolores River	Groundhog Creek
Upper Dolores River	Near Draw
Upper Dolores River	Nicholas Wash
Upper Dolores River	Pat Canyon
Upper Dolores River	Peeled Pine Canyon
Upper Dolores River	Plateau Creek
Upper Dolores River	Pole Creek
Upper Dolores River	Priest Gulch
Upper Dolores River	Rabbit Creek
Upper Dolores River	Rio Lado
Upper Dolores River	Roaring Forks Creek
Upper Dolores River	Rock Spring Creek
Upper Dolores River	Ryman Creek
Upper Dolores River	Ryman Creek
Upper Dolores River	Scotch Creek
Upper Dolores River	Secret Canyon
Upper Dolores River	Silver Creek
Upper Dolores River	Spring Canyon
Upper Dolores River	Spring Creek
Upper Dolores River	Spruce Water Canyon
Upper Dolores River	Stoner Creek
Upper Dolores River	Sulphur Creek
Upper Dolores River	Summit Canyon
Upper Dolores River	Taylor Creek
Upper Dolores River	Tenderfoot Creek
Upper Dolores River	Turkey Creek
Upper Dolores River	West Dolores River (includes Lizardhead wilderness)
Upper Dolores River	Wild Bill Canyon
Upper Dolores River	Wild Steer Canyon
Upper Dolores River	Wildcat Creek (Ryman Creek by Scotch Creek)
Opper Doiores Kiver	w nacat Creek (Kyman Creek by Scotch Creek)

4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs
River Watershed Name	Will to 1
Upper Dolores River	Wildcat Creek
Upper Dolores River	Wildcat Creek
Upper Dolores River	Willow Draw
Upper Dolores River	Wolf Den Canyon
San Miguel River	Brewster Creek
San Miguel River	Dead Horse Creek
San Miguel River	Desert Claim Arroyo
San Miguel River	Dry Creek
San Miguel River	East Naturita Creek
San Miguel River	Hamilton Creek
San Miguel River	Hamilton Creek
San Miguel River	Log Corral Creek
San Miguel River	Log Corral Creek
San Miguel River	Log Corral Creek
San Miguel River	Middle Naturita Creek
San Miguel River	Naturita Creek
San Miguel River	Nelson Creek
San Miguel River	Spectacle Creek
San Miguel River	West Fork Dry Creek
San Miguel River	West Naturita Creek
Piedra River	Archuleta Creek
Piedra River	Bull Creek
Piedra River	Cimarrona Creek
Piedra River	Cimarrona Creek tributary
Piedra River	Coldwater Creek
Piedra River	Deadman Creek
Piedra River	Deep Canyon
Piedra River	Devil Creek
Piedra River	Devil Creek tributary
Piedra River	East Fork Piedra River
Piedra River	First Fork
Piedra River	Goose Creek
Piedra River	Gordon Creek
Piedra River	Horse Creek
Piedra River	Ignacio Creek
Piedra River	Indian Creek
Piedra River	Little Sand Creek
Piedra River	Martinez Creek
Piedra River	Middle Fork Piedra River
Piedra River	Mosca Creek
Piedra River	Pagosa Creek
Piedra River	Piedra River
Piedra River	Porphry Gulch
Piedra River	Sand Creek
Piedra River	Sheep Canyon
Piedra River	Sheep Creek
Piedra River	Skull Canyon
Piedra River	Squaw Creek
Piedra River	Vega la Juana Creek
Piedra River	Weminuche Creek
Piedra River	West Fork Devil Creek

4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs
River Watershed Name	
Piedra River	Williams Creek
Montezuma River	Chico Creek
Montezuma River	Dove Creek
Montezuma River	Monument Canyon
Montezuma River	North Branch Chico Creek
Middle San Juan River	Cottonwood Creek
Middle San Juan River	La Plata River, above Mayday
Mancos River	Box Canyon
Mancos River	Chicken Creek
Mancos River	East Fork Mud Creek
Mancos River	East Mancos River
Mancos River	Horse Creek
Mancos River	Middle Mancos River
Mancos River	West Fork Mud Creek
Mancos River	West Mancos River
Animas River	(tributary E of Junction Creek Campground)
Animas River	(Florida tributary N of Stump Canyon)
Animas River	Animas River, Deer Park to Animas Forks
Animas River	Animas River, Deer Park to Bakers Bridge
Animas River	Bear Creek
Animas River Animas River	Bear Creek
Animas River Animas River	Big Bend Creek
Animas River Animas River	Big Lick Creek
Animas River Animas River	Buck Creek
Animas River Animas River	Canyon Creek
Animas River Animas River	Cascade Creek
	Castle Creek
Animas River Animas River	
Animas River Animas River	Cement Creek
	Cherry Gulch
Animas River	Cinnamon Creek
Animas River	Clear Creek
Animas River	Coon Creek
Animas River	Corral Creek
Animas River	Corral Draw
Animas River	Cunningham Creek
Animas River	Deep Creek
Animas River	Deer Creek
Animas River	Deer Park Creek
Animas River	Dutch Creek
Animas River	East Fork Hermosa Creek
Animas River	Elbert Creek
Animas River	Elk Creek
Animas River	Elk Creek
Animas River	Engine Creek
Animas River	Euraka Gulch
Animas River	Falls Creek
Animas River	Flagler Fork
Animas River	Florida River through Lemon Reservoir
Animas River	Florida River tributary off SJNF
Animas River	Freed Canyon
Animas River	Goulding Creek

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4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs
River Watershed Name	
Upper San Juan River	Fawn Gulch
Upper San Juan River	Fish Creek
Upper San Juan River	Flint Creek
Upper San Juan River	Fourmile Creek
Upper San Juan River	Grimes Creek
Upper San Juan River	Halfway Canyon
Upper San Juan River	Himes Creek
Upper San Juan River	Homer Canyon
Upper San Juan River	Indian Canyon
Upper San Juan River	Jackson Creek
Upper San Juan River	Johnson Creek
Upper San Juan River	Cave Basin Creek
Upper San Juan River	Lake Creek
Upper San Juan River	Leche Creek
Upper San Juan River	Leviathan Creek
Upper San Juan River	Lion Creek
Upper San Juan River	Little Bear Creek
Upper San Juan River	Los Pinos tributary (Lake Creek)
Upper San Juan River	Los Pinos, above Vallecito Reservoir
Upper San Juan River	Los Pinos, in Vallecito Reservoir
Upper San Juan River	Lost Creek
Upper San Juan River	Mill Creek
Upper San Juan River	Navajo River
Upper San Juan River	North Fork Fish Creek
Upper San Juan River	North Fork Texas Creek
Upper San Juan River	Quartz Creek
Upper San Juan River	Rainbow Creek
Upper San Juan River	Red Creek
Upper San Juan River	Rincon La Osa
Upper San Juan River	Rio Blanco
Upper San Juan River	Rito Blanco
Upper San Juan River	Rock Creek
Upper San Juan River	Sand Creek
Upper San Juan River	Sauls Creek
Upper San Juan River	Sheep Cabin Creek
Upper San Juan River	
Upper San Juan River	Sheep Draw Sierra Vandera Creek
11	Silver Creek
Upper San Juan River Upper San Juan River	Snowball Creek
11	
Upper San Juan River	South Fork Texas Creek
Upper San Juan River	Spring Creek
Upper San Juan River	Spring Gulch
Upper San Juan River	Squaretop Creek
Upper San Juan River	Summit Creek
Upper San Juan River	Sunlight Creek
Upper San Juan River	Turkey Creek
Upper San Juan River	Valle Seco
Upper San Juan River	Vallecito Creek
Upper San Juan River	Wallace Gulch

4 <sup>th</sup> level Hydrologic unit	Streams evaluated for eligibility for WSRs	
River Watershed Name		
Upper San Juan River	Weasel Skin Creek	
Upper San Juan River	West Fork of the San Juan River	
Upper San Juan River	Willow Draw	
Upper San Juan River	Wolf Creek and Falls Creek	

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# Appendix E Special Recreation Management Areas

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#### INTRODUCTION

Special Recreation Management Areas (SRMAs) are Bureau of Land Management (BLM) public land areas that require special management due to existing or desired recreational activities that occur there. Public land units identified as an SRMA in land use plans are targeted to receive direct recreation funding and personnel to fulfill commitments made to provide specific, special recreation opportunities. It is also allowable to subdivide SRMAs into Recreation Management Zones (RMZs) to better manage the variety of uses that may occur in different parts of a given SRMA.

The purpose of identifying SRMAs in the Land and Resource Management Plan (LRMP) is to focus management, better direct people to opportunities, and coordinate recreation activities with other multiple uses in the area. SRMAs are planned for and managed in zones to best incorporate unique landscapes, activities, and circumstances. The unique opportunities defining each zone are best described in terms of:

- · Activities and experience; and
- · Benefit opportunities and outcomes.

The term "structured recreation management areas" was applied to both BLM and National Forest Service (NFS) lands in the Draft LRMP. With regards to NFS lands, this concept was dropped in the LRMP because it was not supported by agency policies. Site-specific recreation planning would continue to be used to address recreation management on NFS lands. For BLM lands, the established "Special Recreation Management Area" concept and nomenclature is now applied to the following four SRMAs.

#### CORTEZ SPECIAL RECREATION MANAGEMENT AREA

SRMAs have been identified by the public as important places for various types of recreation within distinct landscape settings and have distinct recreation markets and recreation niches. The types of users, their activities, and specific recreation benefits are identified for each of the SRMAs, and these factors influence the management of the individual areas. BLM policy requires that each SRMA have a distinct boundary and map, that a Recreation Area Management Plan (RAMP) be developed and approved for each SRMA, and furthermore that recreation management is to be the predominant focus of land management in that area. See Figure E-1 at the end of this appendix for a map of the Cortez SRMA.

#### **Supporting Information**

The Cortez/Mancos/Dolores area offers a unique combination of terrain, scenery, and climate that allows for nearly year-round recreation close to towns, as well as surrounded by panoramic backdrops. The relatively small blocks of public land are conducive to non-motorized trail use with opportunities for short motorized trails and clearly defined open play/training areas. The Cortez SRMA comprises two RMZs: 1) the Montezuma Triangle (including Phil's World, Chutes and Ladders, Summit, and Aqueduct) and 2) Mud Springs.

The Montezuma Triangle RMZ is managed to primarily target local hikers, runners, and mountain bikers wanting to participate in human powered-recreation activities within a short commuting distance of town. The Mud Springs RMZ is also managed for non-motorized trails, but includes greater emphasis on motorized recreation while protecting cultural resources.

Other recreation activities are allowable in the Cortez SRMA to the extent they are compatible with the primary targeted activities.

#### The Montezuma Triangle RMZ Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities primarily to Cortez, Dolores, and Mancos area residents to engage in strenuous to easy exercise in a predominantly natural-appearing environment. The area provides opportunities for

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primary targeted activities, including moderately challenging mountain biking, hiking, trail running, dog walking, and similar activities through diverse terrain on trails that are close to the local communities.

Activities: Mountain biking, hiking, trail running, dog walking.

**Experiences:** Needed exercise, develop skills and ability, ability to choose level of physical challenge.

#### **Benefits:**

**Personal:** Improved skills and abilities, greater competence, greater confidence, deeper sense of humility, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands.

Community/Social: Enhanced outdoor-oriented lifestyle.

**Environmental:** Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails, greater community ownership/stewardship of recreation resource attractions.

*Economic:* Reduced health maintenance costs, increased desirability of Cortez, Dolores, and Mancos as places to visit, live, or retire.

Recreation Setting Characteristics Prescriptions			
Physical Components:	Social Components:	Operational Components:	
Remoteness – Predominantly Middle	Contacts – Front Country	Mechanized Use – Middle Country	
Country	Group Size – Front Country	Visitor Services – Front country	
Naturalness – Middle Country	Evidence of Use – Front Country	Management Controls – Front Country	
Facilities – Middle Country			

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail design and layout that harmonizes with the natural setting and uses natural materials.

Trail systems are linked to provide access between isolated public land parcels and neighboring communities and Mesa Verde National Park.

Development of new trails and trailheads for the targeted activities, and pursuit of rights-of-way and easements, would be allowable to achieve goals of 1) expanding opportunities, 2) dispersing use, and 3) linking communities to each other and to isolated parcels of public lands within the SRMA.

Motorized and mechanized use would be limited to designated routes:

- Existing motorized use would continue to occur on designated roads and trails and within two discrete open areas in the Phil's World unit (as depicted in the 2008 Mancos-Cortez Travel Management Plan, Modified Alternative C), as long as it is compatible with the benefits and settings associated with the primary recreational activities.
- Mechanized use would also be limited to designated trails. Any new trails (per above) approved by the BLM would be included within the designated trail system.
- Trails may be realigned/rerouted to minimize motorized/non-motorized trail intersections to improve visitor safety and experiences.

Snow-based winter recreational activities would not be actively managed or promoted (no grooming, facility development, special recreation permits, etc.) in order to minimize impacts to wildlife.

Seasonal area closures would be implemented at Summit, Chutes and Ladders, and Aqueduct to protect seasonal mule deer critical winter range habitat. Subsequent comprehensive travel management planning would provide additional, activity level guidance.

Due to connectivity with the adjacent state land mountain bike trails system, seasonal closures for wildlife at Phil's World cannot be reasonably managed and therefore would not be implemented.

Phil's World: The targeted activity would be mountain biking.

**Chutes and Ladders:** The targeted activity would be mountain biking.

**Summit:** The targeted activity would be hiking/trail running.

Aqueduct: The targeted activity would be mountain biking.

**Other Programs:** Fuels treatments would be allowed that do not require construction of new roads (temporary or permanent) or adversely impact the recreational settings, experiences, benefits, and outcomes of the targeted activities.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails by 1) implementing and maintaining directional trail-riding practices wherever possible and 2) dispersing use seasonally and geographically as much as possible through marketing, education, trailhead and trail development, and other methods.

Keep trails marked and maintained.

Make brochures and maps available to inform visitors.

Provide for visitor health as safety as necessary.

Clearly post visitor information signs at access points; directional signing at trail junctions is provided.

BLM fees for dispersed use are not likely.

Allow domestic animals when under control by leash or voice command.

#### Administration

The BLM Tres Rios Field Office would engage key local government, recreation-tourism industry, mountain bike advocacy groups, and other interested parties as community partners. The partners may include, but are not limited to:

Montezuma County Colorado State Trust Lands Local mountain-bikers Colorado Parks and Wildlife (CPW) Cities of Cortez, Dolores, and Mancos San Juan Mountain Association Colorado Department of Transportation (CDOT)

A new RAMP would be developed in collaboration with local community partners to identify specific management actions for the area within the next 5 years.

Special recreation permits appropriate to the SRMA benefits may be issued per the Colorado Special Recreation Permit Handbook. Permit authorization would take into consideration elements such as public need (does the activity require special gear, training, or knowledge?), viability (is the public need already met by existing permit[s]?), and management benefits (does the proposed activity alleviate or compound existing conditions such as peak use vs. shoulder season?).

#### Management

The BLM would work with the City of Cortez, the towns of Mancos and Dolores, and Montezuma County on a master plan for public land recreation trails that focuses on connecting communities to public lands.

#### Marketing

Basic visitor/marketing information (local guidebooks and trailhead signage) would describe what experience and benefit opportunities are targeted, the character of recreation settings, and the management environment that exists for the Montezuma Triangle RMZ. The BLM works with community partners to develop one set of RMZ-specific information materials that simultaneously facilitate effective management and marketing. The RAMP identifies principal marketing materials and venues to reach community markets targeted in the LRMP. The collaborative management partners review marketing materials to ensure consistency with the above and to ensure that what is being marketed is in fact what is being provided. All agency-specific visitor services initiatives (e.g., interpretation, promotion, special events) are constrained to ensure that only those required to achieve the planning objectives are implemented.

#### Monitoring

The indicators and standards are set by the SRMA objectives and prescriptions within a RAMP. The RAMP outlines procedural frameworks, methods, and schedules for monitoring 1) the attainment of targeted outcomes, 2) maintenance of prescribed setting character conditions, and 3) implementation of planned actions.

#### Mud Springs RMZ Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities primarily to local area motorized recreationists to engage in strenuous to easy exercise in a predominantly natural-appearing environment. The area provides opportunities for off-highway vehicle (OHV) trail riding with an open travel designation of 23 acres for rock crawling. Non-motorized trail use is also allowable as long as it is compatible with the benefits and settings associated with the primary recreational activities.

Activities: Motorcycle, all-terrain vehicle (ATV), Jeep (rock crawling), mountain biking, hiking, and equestrian use

**Experiences:** Needed exercise, develop skills and ability, ability to choose level of physical challenge

#### **Benefits:**

**Personal:** Improved skills and abilities, improved ability to share experiences with other people, greater competence, greater confidence, deeper sense of humility, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands

Community/Social: Enhanced outdoor-oriented lifestyle

**Environmental:** Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails; greater community ownership/stewardship of recreation resource attractions

*Economic:* Reduced health maintenance costs, increased desirability of the local area as a place to visit, live, or retire

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Middle Country	Contacts – Front Country	Mechanized Use – Middle Country
Naturalness – Middle Country	Group Size – Front Country	Visitor Services – Front country
Facilities – Middle Country	Evidence of Use – Front Country	Management Controls – Front Country

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail design and layout that harmonizes with the natural setting and uses natural materials.

Domestic animals are allowed when under leash or voice command.

Motorized and mechanized use would be limited to designated routes:

- Existing motorized use would continue to occur on designated roads and trails and within three discrete
  open areas, as long as it is compatible with the benefits and settings associated with the primary
  recreational activities.
- Mechanized use would also be limited to designated trails.
- Any new trails approved by the BLM would be included within the designated trail system.
- Trails may be realigned/rerouted to minimize impacts to cultural resources and to improve visitor safety and experiences.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails by implementing and maintaining directional trail-riding practices wherever possible, and manage to disperse use seasonally and geographically as much as possible.

Keep trails marked and maintained.

Make brochures and maps available to inform visitors.

Provide for visitor health as safety as necessary.

Clearly post visitor information signs at access points; directional signing at trail junctions is provided.

BLM fees for dispersed use are not likely.

#### Administration

The BLM would engage key local government, recreation-tourism industry, advocacy groups, and other interested parties as community partners. The partners may include, but are not limited to:

Montezuma County City of Cortez

Colorado State Trust Lands San Juan Mountain Association

Local mountain bikers CDOT

**CPW** 

A RAMP would be developed in collaboration with local community partners to identify specific management actions for the area within the next 5 years.

Special recreation permits appropriate to the SRMA benefits may be issued per the Colorado Special Recreation Permit Handbook. Permit authorization would take into consideration elements such as public need (does the activity require special gear, training, or knowledge?), viability (is the public need already met by existing permit[s]?), and management benefits (does the proposed activity alleviate or compound existing conditions such as peak use vs. shoulder season?).

#### Management

The BLM would work with the City of Cortez and Montezuma County on a master plan for public land recreation trails.

#### Marketing

Basic visitor/marketing information (local guidebooks and trailhead signage) would describe what experience and benefit opportunities are targeted, the character of recreation settings, and the management environment that exists for the Mud Springs RMZ. The Dolores Public Lands Office works with community partners to develop one set of RMZ-specific information materials that simultaneously facilitate effective management and marketing. The RAMP identifies principal marketing materials and venues to reach community markets targeted in the LRMP. The collaborative management partners review marketing materials to ensure consistency with the above and that what is being marketed is in fact what is being provided. All agency-specific visitor services initiatives (e.g., interpretation, promotion, special events) are constrained to ensure that only those required to achieve the planning objectives are implemented.

#### Monitoring

The indicators and standards are set by the SRMA objectives and prescriptions within a RAMP. The RAMP outlines procedural frameworks, methods, and schedules for monitoring 1) the attainment of targeted outcomes, 2) maintenance of prescribed setting character conditions, and 3) implementation of planned actions.

#### **DOLORES RIVER SPECIAL RECREATION MANAGEMENT AREA**

SRMAs have been identified by the public as important places for various types of recreation within distinct landscape settings and have distinct recreation markets and recreation niches. The types of users, their activities, and specific recreation benefits are identified for each of the SRMAs and these factors influence the management of the individual areas. BLM policy requires that each SRMA have a distinct boundary and map, that a RAMP be developed and approved for each SRMA, and furthermore that recreation management is to be the predominant focus of land management in that area. See Figure E-2 at the end of this appendix for a map of the Dolores River SRMA.

#### **Supporting Information**

The lower Dolores River winds through southwest Colorado mesa country, leaving a canyon reminiscent of the Grand, which provides a complete spectrum of recreational opportunities and settings. Between Bradfield Bridge and Bedrock are opportunities for primitive recreation and rugged jeeping, in settings ranging from wilderness study areas (WSAs) to developed campgrounds. The Dolores River SRMA is managed to provide for a broad range of recreational benefits, primarily to river users, from the southwestern United States and local residents who participate in rafting. Within various RMZs, focus is also placed on the outcomes and benefits associated with fishing, challenging mountain biking, and jeeping. Other recreation activities are allowed when compatible with the primary targeted activities. The area has designated routes for recreational motorized use. Motorized watercraft is prohibited from Bradfield Bridge to Bedrock. The Dolores River Corridor Management Plan (1990) and OHV designation (CO-030-8601) (1986) guides management of recreation in the area until and updated RAMP and Comprehensive Travel Management Plan are completed.

The area is composed of four RMZs: 1) Bradfield Ranch to Dove Creek Pump Station, 2) Dove Creek Pump Station to Disappointment Creek, 3) Disappointment Creek to Gypsum Valley Bridge, and 4) Gypsum Valley Bridge to Bedrock.

#### Bradfield Ranch to Dove Creek Pump Station (RMZ 1) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities for visitors and residents to engage in non-motorized river boating in a primarily primitive Recreation Opportunity Spectrum (ROS) setting, recognizing that during periods of boatable water releases, social and operational settings would more closely align with a Middle Country to Front Country setting.

**Activities:** Rafting, fishing, camping (at Bradfield Bridge developed recreation site)

**Experiences:** Opportunities for self-reliance, bonding with family and friends, and skill building in a remote and natural appearing setting. This helps produce desired outcomes such as improved health and self-confidence, stronger family connections, and stewardship of private and public lands.

#### **Benefits:**

**Personal:** Improved skills and abilities, greater competence, greater confidence, improved cardiovascular and muscle strength, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands.

Community/Social: Enhanced outdoor-oriented lifestyle, bonding with friends and family.

*Environmental:* Improved respect for public and privately owned lands, greater retention of distinctive natural landscape features.

*Economic:* Reduced health maintenance costs, increased desirability of southwest Colorado as a place to visit, live, or retire, economic benefits to southwest Colorado from visitor expenditures.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Primitive Naturalness – Primitive Facilities – Primitive	Contacts – Predominantly Primitive to Front Country (during boatable water) Group Size – Predominantly Primitive to Front Country (during boatable water)	Mechanized Use – Primitive  Visitor Services – Predominantly  Primitive to Front Country (during boatable water)
	Evidence of Use – Primitive to Back Country	Management Controls – Predominantly Primitive to Front Country (during boatable water)

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail, trailhead, and campground (Bradfield Bridge) design and layout that harmonizes with the natural setting and uses natural materials.

All boaters would register at river launch points.

Commercial river rafting is managed under an allocation system established in the Dolores River Corridor Management Plan.

**Other Programs:** Facilities, structures, or other improvements would not be implemented, which would impact the recreation setting characteristics prescriptions.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Provide brochures, guidebooks, maps, and some BLM staff/volunteers available to assist visitors.

Administer periodic enforcement presence especially during the whitewater season (April 1–June 18).

Post visitor information signs at main river access points.

Individual user fees are not likely.

#### Dove Creek Pump Station to Disappointment Creek (RMZ 2) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities for a moderate number of visitors to experience spectacular natural scenery, non-motorized river boating, OHV touring, mountain biking, and other quiet use activities in a Middle Country setting.

**Activities:** Rafting, OHV use, mountain biking, fishing, camping (including developed camping at Box Elder recreation site and dispersed camping).

**Experiences:** Opportunities to enjoy high-quality canyon landscapes, escape from crowds, and enjoy tranquility and peacefulness. This helps produce desired outcomes such as a deeper sense of personal humility, greater sensitivity to and awareness of natural beauty, reduced stress, and a more holistic sense of well-being.

#### **Benefits:**

**Personal:** Improved skills and abilities, greater competence, greater confidence, improved cardiovascular and muscle strength, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands.

Community/Social: Enhanced outdoor-oriented lifestyle, bonding with friends and family.

*Environmental:* Improved respect for public and privately owned lands, greater retention of distinctive natural landscape features.

*Economic:* Reduced health maintenance costs, increased desirability of southwest Colorado as a place to visit, live, or retire, economic benefits to southwest Colorado from visitor expenditures.

Recreation Setting Characteristics Prescriptions		
Social Components:	<b>Operational Components:</b>	
Contacts – Predominantly Middle Country to Front Country (during boatable water)  Group Size – Predominantly Middle Country to Front Country (during boatable water)  Evidence of Use – Middle Country to	Mechanized Use – Middle Country  Visitor Services – Predominantly  Middle Country to Front Country (during boatable water)  Management Controls –  Predominantly Middle Country to Front Country (during boatable water)	
	Social Components:  Contacts – Predominantly Middle Country to Front Country (during boatable water)  Group Size – Predominantly Middle Country to Front Country (during boatable water)	

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain area's predominantly natural-appearing landscape through trail, trailhead, and campground design and layout that harmonizes with the natural setting and uses natural materials.

Mechanized and motorized use (2X4s and 4X4s) is allowed on designated routes.

All boaters would register at initial put-ins.

Commercial river rafting is managed under an allocation system established in the Dolores River Corridor Management Plan.

**Other Programs:** Facilities, structures, or other improvements would not be implemented, which would impact the recreation setting characteristics prescriptions.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Provide brochures, guidebooks, maps, and some BLM staff/volunteers available to assist visitors.

Administer periodic enforcement presence especially during the whitewater season (April 1-June 18).

Post visitor information signs at main river access points.

Do not implement individual user fees.

#### Disappointment Creek to Gypsum Valley Bridge (RMZ 3) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities primarily for southwest Colorado and southwestern U.S. visitors to engage in recreational rafting and similar activities on the Dolores River in a predominantly Middle Country setting.

Activities: Rafting, camping, fishing.

**Experiences:** Opportunities to develop skills and abilities, enjoy strenuous outdoor physical exercise, and enjoy scenery and nature. This helps produce desired outcomes such as improved health and self-confidence, stronger family connections, and stewardship of private and public lands.

#### **Benefits:**

**Personal:** Improved skills and abilities, greater competence, greater confidence, improved cardiovascular and muscle strength, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands.

Community/Social: Enhanced outdoor-oriented lifestyle, bonding with friends and family.

*Environmental:* Improved respect for public and privately owned lands, greater retention of distinctive natural landscape features.

*Economic:* Reduced health maintenance costs, increased desirability of southwest Colorado as a place to visit, live, or retire, economic benefits to southwest Colorado from visitor expenditures.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Naturalness – Middle Country  Facilities – Middle Country  (C) (C) (E)	Contacts – Predominantly Middle Country to Front Country (during boatable water)  Group Size – Predominantly Middle Country to Front Country (during boatable water)  Evidence of Use – Middle Country to Front Country (during boatable water)	Mechanized Use – Middle Country  Visitor Services – Predominantly Middle Country to Front Country (during boatable water)  Management Controls – Predominantly Middle Country to Front Country (during boatable water)

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail design and layout that harmonizes with the natural setting and uses natural materials.

Mechanized and motorized use (2X4s and 4X4s) is allowed on designated routes.

All boaters would register at initial put-ins.

Commercial river rafting is managed under an allocation system established in the Dolores River Corridor Management Plan.

**Other Programs:** Facilities, structures, or other improvements would not be implemented, which would impact the recreation setting characteristics prescriptions, though location of rights-of way, utilities, and management facilities may occur in this RMZ.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Provide brochures, guidebooks, maps, and some BLM staff/volunteers available to assist visitors.

Administer periodic enforcement presence especially during the whitewater season (April 1-June 18).

Post visitor information signs at main river access points.

Do not implement individual user fees.

#### Gypsum Valley Bridge to Bedrock (RMZ 4) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities primarily for visitors to engage in non-motorized water-based activity, challenging whitewater boating, and similar activities on designated trails in a wilderness setting.

Activities: Whitewater rafting, boating, fishing, camping.

**Experiences:** Opportunities to develop skills and abilities, enjoy strenuous outdoor physical exercise, and gain a greater sense of self-confidence. These benefits help produce desired outcomes such as improved health and self-confidence, stronger family connections, and stewardship of private and public lands.

#### **Benefits:**

**Personal:** Improved skills and abilities, greater competence, greater confidence, improved cardiovascular and muscle strength, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands.

*Community/Social:* Enhanced outdoor-oriented lifestyle, bonding with friends and family, opportunity to contribute to stewardship efforts that benefit society.

Environmental: Improved stewardship of public and privately owned lands.

**Economic:** Reduced health maintenance costs, economic benefits from visitor purchases.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Primitive Naturalness – Primitive Facilities – Primitive	Contacts – Predominantly Primitive to Front Country (during boatable water) Group Size – Predominantly Primitive to Front Country (during boatable water)	Mechanized Use – Primitive  Visitor Services – Predominantly Primitive to Front Country (during boatable water)
	Evidence of Use – Primitive to Back Country	Management Controls – Predominantly Primitive to Front Country (during boatable water)

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape.

All boaters would register at river launch points.

Commercial river-rafting is managed under an allocation system established in the Dolores River Corridor Management Plan.

**Other Programs:** Facilities, structures, or other improvements would not be implemented or approved in the WSA.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Provide brochures, guidebooks, maps, and some BLM staff/volunteers available to assist visitors.

Administer periodic enforcement presence especially during the whitewater season (April 1-June 18).

Post visitor information signs at main river access points.

Do not implement individual user fees.

#### Management

The environmental setting prescriptions are established and maintained as a result of implementation of specific actions identified in the Dolores River Corridor Management Plan, travel management plans, and future recreation management plans.

Management is focused on enhancing recreation access, visitor safety and sanitation, and protection of associated cultural and natural resources. This generally takes the form of established river access and launch facilities and parking areas, travel management, basic sanitation and effective visitor information. Higher levels of facility development are provided for in locations closer to McPhee Reservoir.

#### Marketing

Basic visitor/marketing information describes what experience and benefit opportunities are targeted, the character of recreation settings, and the facilities that exist or not for each RMZ. The BLM collaborates with community partners to develop one set of RMZ-specific information materials that simultaneously facilitate appropriate management and promotion. The RAMP identifies principal marketing materials and venues to reach recreation-tourism markets targeted in the LRMP. The collaborative management partnership reviews marketing materials for consistency with management goals and to ensure that what is being marketed is in fact what is being provided. All agency-specific visitor services initiatives (e.g., interpretation, promotion, special events) are constrained to ensure that only those required to achieve the planning objectives are implemented.

#### Monitoring

The indicators and standards are set by the SRMA objectives and prescriptions in the LRMP and the river corridor plan. The RAMP would outline procedural frameworks, methods, and schedules for monitoring 1) the attainment of targeted outcomes, 2) maintenance of prescribed setting character conditions, and 3) implementation of planned actions.

#### Administration

The BLM would engage key local government, recreation-tourism industry, and other interested parties as community partners. The partners may include, but are not limited to:

San Miguel County Dolores County

CPW Colorado Tourism Office Boating community Bureau of Reclamation

Special recreation permits would be issued as per the Colorado Special Recreation Permit Handbook and allocations in the Dolores River Corridor Management Plan. Permit authorization would take into consideration elements such as public need (does the activity require special gear, training, or knowledge?), viability (is the public need already met by existing permit[s]?), and management benefits (does the proposed activity alleviate or compound existing conditions such as peak use vs. shoulder season?).

#### DURANGO SPECIAL RECREATION MANAGEMENT AREA

SRMAs have been identified by the public as important places for various types of recreation within distinct landscape settings and have distinct recreation markets and recreation niches. The types of users, their activities, and specific recreation benefits are identified for each of the SRMAs and these factors influence the management of the individual areas. BLM policy requires that each SRMA have a distinct boundary and map, that a RAMP be developed and approved for each SRMA, and furthermore that recreation management is to be the predominant focus of land management in that area. See Figure E-3 at the end of this appendix for a map of the Durango SRMA.

#### **Supporting Information**

Durango is a mountain community with an active population and tourist base drawn to the area due to proximity of quality recreational opportunities. The Durango SRMA is managed to provide benefits associated with quality non-motorized recreation activities within a short travel distance of the increasingly developed Durango interface area. While setting is important, it is easy access to rock climbing areas a variety of well-designed, single-track trails that make this SRMA an important asset to the community and surrounding region. Specifically, this SRMA would benefit non-motorized trail users and climbers, Durango area recreational service providers (outfitters, retail stores, etc.), and open space advocates.

The area is composed of two RMZs: 1) Animas City Mountain, Skyline, and Grand View and 2) East Animas and Turtle Lake climbing areas.

Cultural resources are prevalent throughout the unit and care must be taken to avoid impacting these resources. This includes trail design and location, as well as climbing routes and anchor locations.

Saleable mineral materials (gravel) are also prevalent in the area and represent a scarce commodity for a growing community. As such, the southern portion (south of the southern rim of Big Canyon as it runs from southwest to northeast, then south of the large power lines toward the east to the BLM boundary) of the Grandview area is not included in the SRMA. Trails exist in this portion of the Grandview area, and may continue to exist, though gravel operations may result in altered landscapes and trail reroutes. Additionally, areas impacted by gravel development may serve as future trailhead parking and access into the southern portion of the SRMA once gravel operations are completed and areas are reclaimed/repurposed. A portion of known gravel deposits are located between the large power line and Big Canyon. These deposits fall within the SRMA but are not expected to be used over the life of the LRMP.

#### Animas City Mountain, Skyline, and Grandview (RMZ 1) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities to engage in strenuous, hiking, intermediate to advanced mountain biking, dog walking and similar summer activities on trails in a natural-appearing setting proximal to the Durango wildland urban interface (WUI).

**Activities:** Mountain biking, hiking, trail running, dog walking; other recreation activities are allowable if compatible with the primary targeted activities.

**Experiences:** Developing skills and abilities, physical exercise, enjoying having access to close-to-home outdoor amenities, relishing closeness with pets, relishing group affiliation and togetherness, enjoying easy access to natural landscape.

#### **Benefits:**

**Personal:** Improved mental and physical health, greater sense of well-being, stronger ties with family and friends, improved relationship with nature.

Community/Social: Reduced exposure to at-risk youth, greater community involvement in land-use decisions.

Environmental: Reduced negative human impacts to environment, increased appreciation for natural

environment, reduced wildlife disturbance between domestic animals and people.

**Economic:** Increased property value, increased desirability of Durango as a place to visit, live, or retire.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	<b>Operational Components:</b>
Remoteness – Front Country-Rural	Contacts – Predominantly Rural to	Mechanized Use – Back Country
Naturalness – Front Country-Rural Facilities – Front Country-Rural	Urban  Group Size – Predominantly Rural to Urban  Evidence of Use – Predominantly Rural to Urban	Visitor Services – Back Country Management Controls – Back Country

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail design and layout that harmonizes with the natural setting and uses natural materials.

Areas support summer day-use dispersed activities.

Mechanized use is acceptable.

Domestic animals are allowed when under control by leash or voice command.

In Animas City Mountain and Grand View Ridge, a conditions-based winter wildlife closure would be implemented in order to protect critical and severe winter range and winter concentrations areas for elk and mule deer. These closures may be implemented at any time between December 1 and April 30. The closures would be based on existing snow conditions and/or the level of wildlife use for the given area. The specific conditions that would trigger a closure or that would allow the BLM to open these areas in the spring would be based on snow conditions of 16 inches at Cemetery Flats. Parameters for re-opening would be based on 1) general assessment of the north-facing slope, such as absence of snow; 2) weather/ snow condition in the general surrounding area; 3) presence of big game on Animas Mountain and/or at higher elevations; and 4) coordination with CPW.

Motorized and mechanized use would be limited to designated routes:

- Any new trails approved by the BLM would be included within the designated trail system.
- Trails may be realigned/rerouted to improve visitor safety and experiences, and minimize impacts to physical and cultural resources.

Other Programs: Fuels treatments would be allowed to protect WUI areas and consider converting fuels access routes into trails.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails by 1) implementing and maintaining directional trail-riding practices wherever possible and 2) dispersing use seasonally and geographically as much as possible through marketing, education, trailhead and trail development, and other methods.

Locate trails to avoid impacts to cultural resources.

Keep trails marked and maintained.

Monitor periodically especially during the summer.

Make brochures and maps available to inform visitors.

Provide for visitor health as safety as necessary.

Clearly post visitor information signs at access points.

Do not charge BLM fees for dispersed use.

Establish memoranda of understanding to work with adjacent entities (e.g., city, county, CPW) for cooperative recreation management. Consider exchanges or disposals to facilitate cohesive management objectives.

#### East Animas/Turtle Lake Climbing Areas (RMZ 2) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

Provide opportunities primarily for area residents (and others) to engage in rock climbing, bouldering, and similar activities close to Durango.

**Activities:** Rock climbing, bouldering; other recreation activities are allowable if compatible with the primary targeted activities.

**Experiences:** Developing skills and abilities, enjoying strenuous outdoor physical exercise, enjoying having access close to town for outdoor activities.

#### **Benefits:**

*Personal:* Improved skills and abilities, greater competence, greater confidence, improved cardiovascular and muscle strength, improved capacity for outdoor physical activity, improved understanding of our community's dependence and impact on public lands and adjoining private lands

*Community/Social:* Enhanced outdoor-oriented lifestyle, increased pride in the community.

*Environmental:* Improved respect for public and privately owned lands.

*Economic:* Reduced health maintenance costs, increased desirability of Durango as a place to visit, live, or retire.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Front Country	Contacts – Middle Country	Mechanized Use – Primitive
Naturalness – Front Country	Group Size - Middle Country	Visitor Services – Middle Country
Facilities – Middle Country	Evidence of Use – Middle Country	Management Controls – Middle Country

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail design and layout that harmonizes with the natural setting and uses natural materials.

Use of permanent anchors and bolts is allowable, but located away from cultural resources.

Domestic animals are allowed when under control by leash or voice command.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails by dispersing use seasonally and geographically as much as possible through marketing, education, trailhead and trail development, and other methods.

Keep trails marked and maintained.

Provide limited trailheads and parking.

Monitor periodically, especially during the summer.

Provide for visitor health as safety as necessary

Make brochures and maps available to inform visitors.

Clearly post visitor information signs at access points.

BLM fees for dispersed use are not likely

Address health and safety issues, sanitation, and trespass through education/interpretation and active management controls.

#### Management

The recreation setting prescriptions are created by sustaining beneficial setting characteristics and carrying out management actions designed to change incompatible characteristics of the recreation setting. A travel management plan would be prepared within 5 years of the completion of the LRMP, and a RAMP that identifies specific management actions would also be developed. The RAMP is developed and implemented in collaboration with local community partners.

Updating the Durango city trail system to include the Skyline Ridge RMZ is desirable, in cooperation with the City of Durango.

Management would be geared towards facilitation of access to recreation activity opportunities for local residents in Durango (not exclusive of area residents). For example, trailheads could be developed on state, city, CDOT, and private land for access to public trails for dog walking, trail running, hiking, and similar activities.

#### Marketing

Basic visitor/marketing information (local guidebooks and trailhead signs, for example) would describe what experience and benefit opportunities are targeted, the character of recreation settings, and the service environment that exists for each RMZ. The BLM collaborates with community partners to develop one set of RMZ-specific information materials that would simultaneously facilitate effective management and visitor information. The RAMP identifies principal marketing materials and venues to reach targeted community markets. The collaborative management partners review marketing materials to ensure consistency with the above and to ensure that what is being marketed is in fact what is being provided. All agency-specific visitor services initiatives (e.g., interpretation, promotion, special events) are limited to only those required to achieve the planning objectives are implemented.

#### Monitoring

The indicators and standards are set by the SRMA objectives and prescriptions in the LRMP. The RAMP outlines procedural frameworks, methods, and schedules for monitoring: 1) the attainment of targeted outcomes, 2) maintenance of prescribed setting character conditions, and 3) implementation of planned actions.

#### Administration

The BLM would engage key local governments, the recreation-tourism industry, trails advocates, and others as community partners. The partners may include, but are not limited to:

La Plata County City of Durango

CPW San Juan Mountain Association

Trails 2000 CDOT
Access fund Local climbers

A new RAMP would be developed in collaboration with community partners to identify specific management actions for the area.

Special recreation permits may be issued per the Colorado Special Recreation Permit Handbook. Permit authorization would take into consideration elements such as public need (does the activity require special gear, training, or knowledge?), viability (is the public need already met by existing permit[s]?), and management benefits (does the proposed activity alleviate or compound existing conditions such as peak use vs. shoulder season?).

#### SILVERTON SPECIAL RECREATION MANAGEMENT AREA

SRMAs have been identified by the public as important places for various types of recreation within distinct landscape settings and have distinct recreation markets and recreation niches. The types of users, their activities, and specific recreation benefits are identified for each of the SRMAs and these factors influence the management of the individual areas. BLM policy requires that each SRMA have a distinct boundary and map, that a RAMP be developed and approved for each SRMA, and furthermore that recreation management is to be the predominant focus of land management in that area. See Figure E-4 at the end of this appendix for a map of the Silverton SRMA.

#### **Supporting Information**

The Silverton area is a unique alpine landscape dominated by 13,000-foot peaks and rich in mining history. The combination of rugged, seemingly impenetrable mountain peaks with the infrastructure left by industrious miners has resulted in a recreational destination for both winter and summer enthusiasts. The Silverton SRMA targets southwestern U.S. visitors (Colorado, Texas, New Mexico, Arizona, Utah, Nevada, and California) and local residents wanting to participate in heritage tourism along an All-American Road (the San Juan Skyway), the Alpine Loop National Backcountry Byway, and challenging ATV and jeep routes. The Silverton SRMA provides access to the Weminuche wilderness, mountain biking and whitewater rafting on the Animas River. During the winter months, the Silverton ski area provides opportunities for extreme skiing, while the rest of the SRMA provides both motorized oversnow experiences and non-motorized winter recreation experiences. Other recreation activities are allowed to the extent they are compatible with the primary targeted activities. Motorized recreation travel routes have been designated in this SRMA since the 1980s. A RAMP was completed in 2010 in cooperation with local community partners to identify specific management actions.

The area comprises two RMZs: 1) Summer and 2) Winter.

#### Silverton Summer (RMZ 1) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities primarily for regional and local recreationists to engage in driving for pleasure,  $4 \times 4$  vehicle touring, mountain biking, visiting historic sites, and similar activities on paved and primitive routes, some of which are close to the Weminuche wilderness and WSAs.

**Activities:** Slow-paced OHV touring and mountain biking along rugged mountain roads/primitive roads, hiking, fishing, and other non-motorized activities off of main travel routes, heritage tourism at historic mine sites and town sites such as Animas City, dispersed and developed camping.

**Experiences:** Enjoying high alpine scenery, being close to nature, experiencing historic cultural tourism, being with family and friends, learning about area history.

#### **Benefits:**

**Personal:** Improved skills and ability, greater connection with nature, reduced stress, greater respect for cultural heritage, stronger ties with friends and family.

*Community/Social:* Improved family bonding, greater community involvement in land use decisions, enhanced lifestyle.

*Environmental:* Improved respect for public/private lands, improved protection of heritage/cultural/natural resources, increased ecologically friendly tourism operations.

**Economic:** Improved local economic stability, increased local job opportunities, increased property values.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Back Country (WSAs) to Middle Country (Alpine Loop Routes)  Naturalness – Back Country (WSAs) to Middle Country (Alpine Loop Routes)  Facilities – Back Country (WSAs) to Front Country (Alpine Loop Routes)	Contacts – Back Country (WSAs) to Front Country (Alpine Loop Routes) Group Size – Back Country (WSAs) to Front Country (Alpine Loop Routes) Evidence of Use – Back Country (WSAs) to Front Country (Alpine Loop Routes)	Mechanized Use – Back Country (WSAs) to Middle Country (Alpine Loop Routes)  Visitor Services – Back Country (WSAs) to Front Country (Alpine Loop Routes)  Management Controls – Back Country (WSAs) to Middle Country (Alpine Loop Routes)

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing landscape through trail, trailhead, and campground design and layout that harmonizes with the natural setting and uses natural materials.

Mechanized and motorized use(2X4s and 4X4s) is acceptable on designated routes.

Domestic animals are allowed when under control by leash or voice command

Other Programs: Sheep grazing management techniques are implemented to minimize impacts along developed recreation sites and trails.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails by 1) implementing and maintaining directional trail-riding practices wherever possible and 2) dispersing use seasonally and geographically as much as possible through marketing, education, trailhead and trail development, and other methods.

Keep trails marked and maintained.

Implement frequent monitoring and enforcement presence especially during the summer.

Clearly post portal signage with rules at access points.

Make brochures and maps available to inform visitors.

Provide for visitor health and safety as necessary.

Individual user fees are not likely.

Designate, define, and harden dispersed campsites as necessary.

#### Silverton Winter (RMZ 2) Objective(s) Decision

**Objective Statement:** By the year 2015 the mean (average) response is at least a "moderate" (i.e., 3.0 on a probability scale where 1 = not at all, 2 = somewhat, 3 = moderate, 4 = complete/total realization) attainment of the following experiences and benefits.

The RMZ would provide opportunities for regional and local recreationists to experience spectacular natural scenery, cultural landscapes, heritage tourism with interpretive opportunities, and winter recreation for motorized and non-motorized quiet activities in a natural appearing setting.

**Activities:** Snowmobiling, snowshoeing, cross-country and downhill (traditional and helicopter supported) skiing, ice climbing.

**Experiences:** Developing skills/abilities, relishing group affiliations and togetherness, enjoying strenuous physical exercise, being closer to nature, enjoying high alpine scenery.

#### **Benefits:**

**Personal:** Restored mind from unwanted stress, greater communication with nature, improved mental well-being, greater sense of adventure, heightened awareness of the natural world.

**Community/Social:** Greater community involvement in land use decisions and stewardship, more informed citizen about where to go for differing kinds of experiences, heightened sense of place and community identity.

*Environmental:* Maintenance of distinctive recreation setting character.

*Economic:* Increased local job opportunities, greater value-added local industry services.

Recreation Setting Characteristics Prescriptions		
Physical Components:	Social Components:	Operational Components:
Remoteness – Back Country (WSAs) to Middle Country	Contacts – Back Country (WSAs) to Front Country	Mechanized Use – Back Country (WSAs) to Middle Country
Naturalness – Back Country (WSAs) to Middle Country	Group Size – Back Country (WSAs) to Front	Visitor Services – Back Country (WSAs) to Middle Country
Facilities – Back Country (WSAs) to Middle Country	Evidence of Use – Back Country (WSAs) to Front Country	Management Controls – Back Country (WSAs) to Middle Country

#### **Management Actions and Allowable Use Decisions**

#### **Recreation and Visitor Services Program:**

The BLM would retain the area's predominantly natural-appearing setting.

Non-motorized use is acceptable and focused in WSAs.

Motorized use (snowmobiles) is acceptable only in limited or open areas per travel management plan decisions.

Domestic animals are allowed when under control by leash or voice command.

#### **Implementation Decisions**

#### **Implementation Decisions:**

Minimize social contacts on trails dispersing use geographically as much as possible through marketing, education, trailhead and trail development, and other methods.

Maintain hardened turnouts and visitor services to protect soil and vegetation and reduce social conflicts.

Establish designated parking for motorized use to ensure quality recreation experiences.

Mark and maintain access to winter activities and trailheads.

Make winter trailheads available for non-motorized opportunities.

Implement frequent monitoring and enforcement presence, especially on weekends and holidays.

Clearly post signage with rules at access points.

Make brochures and maps available to inform visitors.

Provide for visitor health and safety as necessary.

#### Management

Management is focused on enhancing recreation activity opportunities for visitors to the Silverton area and local residents. This generally takes the form of route designation, parking area improvements, and basic sanitation and visitor information. For example, trails and access points with visitor information would be developed for snowmobiles, mountain bikes, OHV riders, hikers, Nordic recreationists, and similar activities.

#### Marketing

Effective visitor/marketing venues (brochures, web information, etc.) describe what experience and benefit opportunities are targeted, the character of recreation settings, and the facilities that exist for each RMZ. The BLM and U.S. Forest Service collaborate with community partners to develop one set of RMZ-specific information materials to simultaneously facilitate appropriate management and promotion. The RAMP identifies principal marketing materials and venues to reach recreation-tourism markets targeted in the LRMP. The collaborative management partnership ensures that marketing materials are consistent with area goals and that what is being marketed is in fact what is being provided. All agency-specific visitor services initiatives (e.g., interpretation, promotion, special events) are constrained to ensure that only those required to achieve the planning objectives are implemented.

#### Monitoring

The indicators and standards are set by the SRMA objectives and prescriptions in the LRMP. The RAMP would outline procedural frameworks, methods, and schedules for monitoring: 1) the attainment of targeted outcomes, 2) maintenance of prescribed setting character conditions, and 3) implementation of planned actions.

#### Administration

The BLM would engage key local government, recreation-tourism industry, and other interested parties as community partners. The partners may include, but are not limited to:

San Juan County

CPW

Silverton Chamber

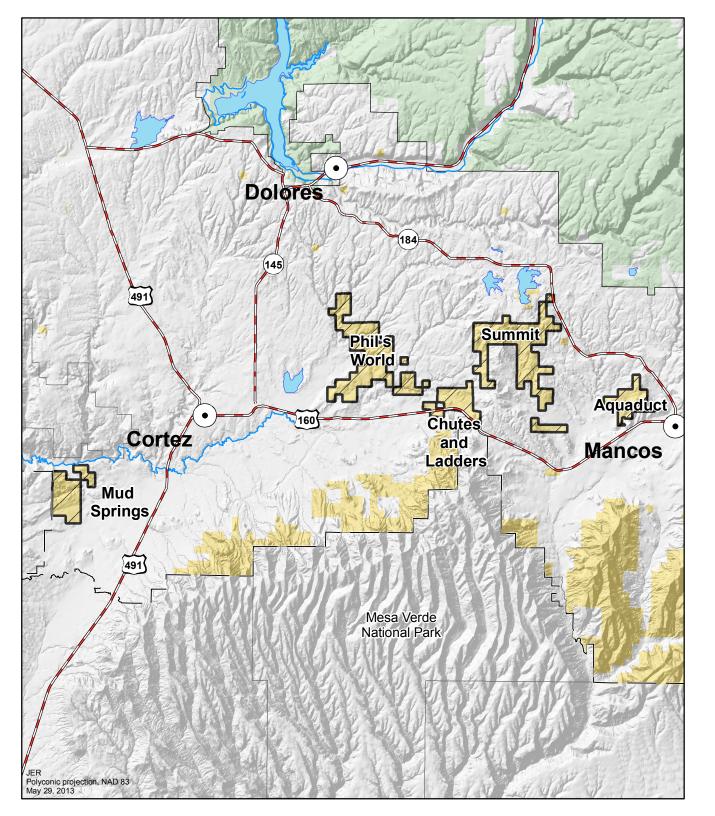
Colorado Tourism Office

Silverton Mountain School

Silverton Snowmobile Club

An updated RAMP and travel management plan is developed, when necessary, in collaboration with local community partners to identify specific management actions for the) area.

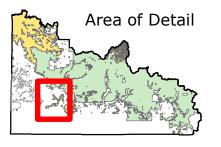
Special recreation permits may be issued per the Colorado Special Recreation Permit Handbook. Permit authorization would take into consideration elements such as public need (does the activity require special gear, training, or knowledge?), viability (is the public need already met by existing permit[s]?), and management benefits (does the proposed activity alleviate or compound existing conditions such as peak use vs. shoulder season?).



# Cortez Special Recreation Management Area Tres Rios Field Office Figure E-1



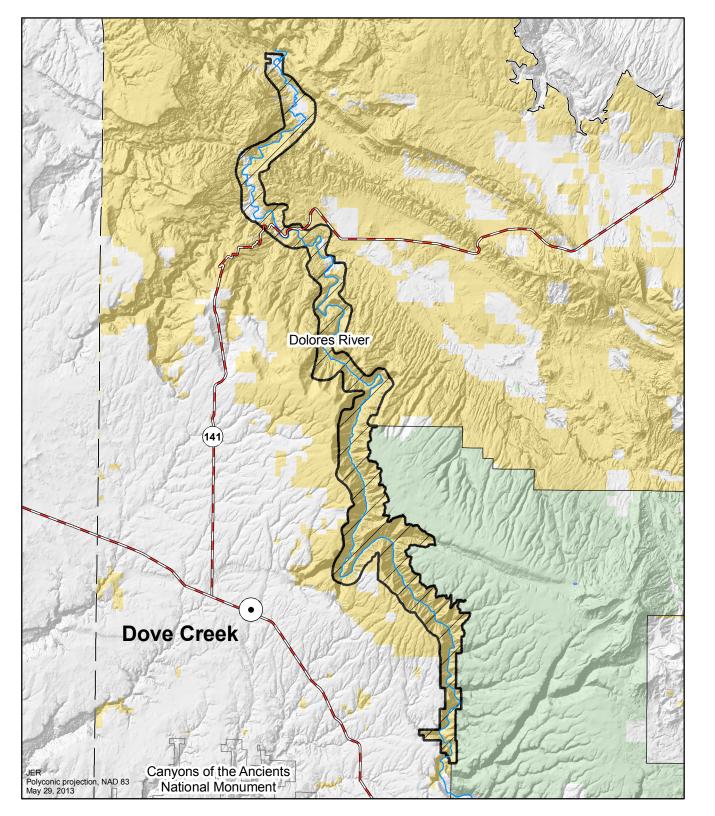






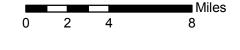
The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

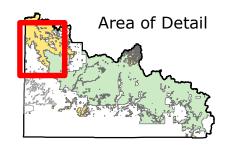
San Juan National Forest and Tres Rios Field Office LRMP and FEIS

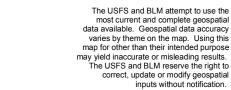


# Dolores River Special Recreation Management Area Tres Rios Field Office Figure E-2

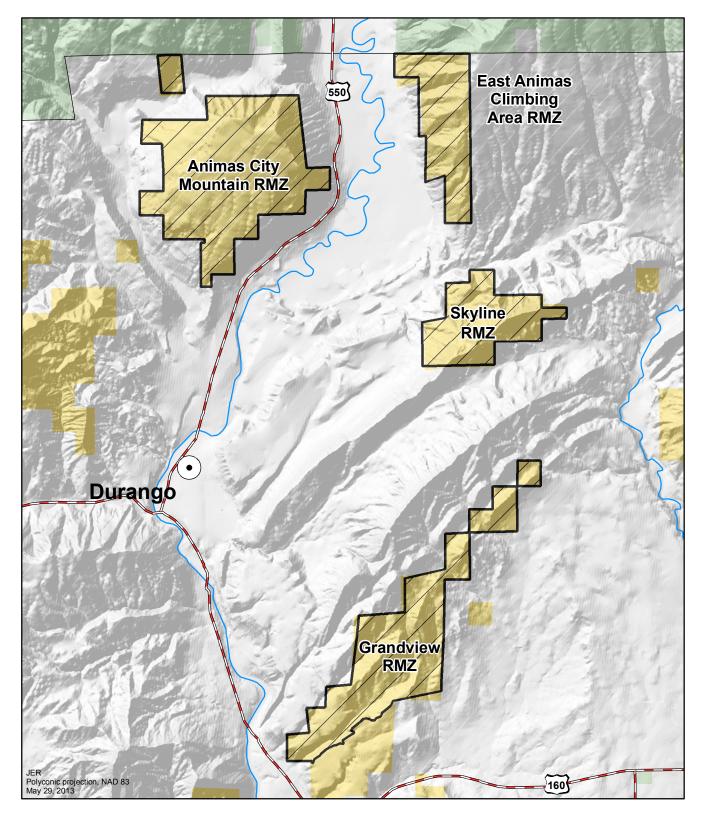






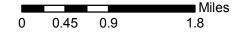


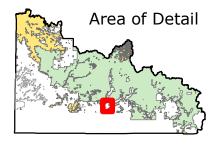
San Juan National Forest and Tres Rios Field Office LRMP and FEIS



## Durango Special Recreation Management Area Tres Rios Field Office Figure E-3

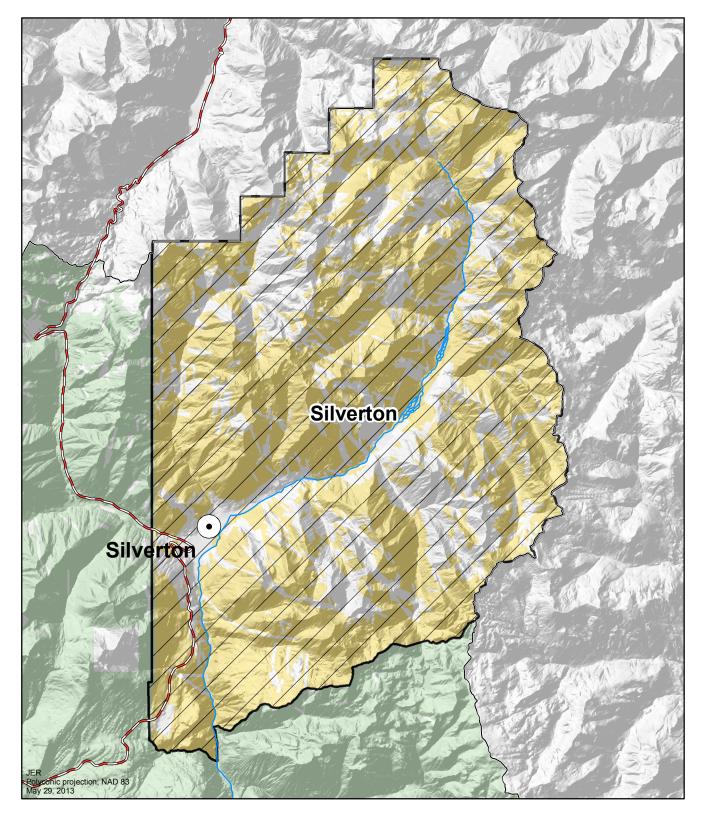








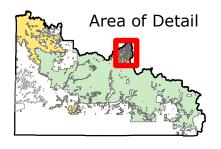
San Juan National Forest and Tres Rios Field Office LRMP and FEIS



# Silverton Special Recreation Management Area Tres Rios Field Office Figure E-4









The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

San Juan National Forest and Tres Rios Field Office LRMP and FEIS

## Appendix F Projected Activities for Impacts Analysis

#### **INTRODUCTION**

This appendix, in conjunction with Chapter 2 of the Final Environmental Impact Statement (FEIS), describes the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) projected activities and assumptions that were used in the analysis of environmental consequences in Chapter 3 of the FEIS. All figures in this document are estimates of outputs and suitable acres.

Table F.1: San Juan National Forest Acres of Fuels Treatments by Cover Type (average acres, per year, over

the life of the Land and Resource Management Plan)

the fire than and resource Francy ment I fan)						
Fuels Treatment	Alternative A	Alternative B	Alternative C	Alternative D		
Pinyon-juniper	500 mastication	500 mastication	500 mastication	1,000 mastication		
r iliyon-jumper	500 prescribed fire	500 prescribed fire	500 prescribed fire	500 prescribed fire		
Mixed	2,000 mastication	2000 mastication	2000 mastication	2,000 mastication		
shrubland	1,000 prescribed fire	1000 prescribed fire	1000 prescribed fire	1,000 prescribed fire		
	1,000 mastication	1000 mastication	1000 mastication	1,500 mastication		
Dandarasa nina	3,500 prescribed fire	scribed fire   3500 prescribed fire   3500 p		3,500 prescribed fire		
Ponderosa pine	500 mechanical	500 mechanical	500 mechanical	500 mechanical		
	restoration	restoration	restoration	restoration		
Warm dry	1,000 prescribed fire	1,000 prescribed fire	1,000 prescribed fire	1,000 prescribed fire		
mixed conifer	500 mechanical	500 mechanical	500 mechanical	500 mechanical		
IIIIXEG COIIIIEI	restoration	restoration	restoration	restoration		
Mixed	1 to 20,000	1 up to 50,000 fire	1 up to 50,000 fire	1 up to 50,000 fire		
	fire managed for	managed for resource	managed for resource	managed for resource		
vegetation	resource benefit	benefit	benefit	benefit		
	1 to 20,000 fire	1up to 50,000 fire	1 up to 50,000 fire	1 up to 50,000 fire		
Spruce-fir	managed for resource	managed for resource	managed for resource	managed for resource		
	benefit	benefit	benefit	benefit		

Table F.2: Tres Rios Field Office Acres of Fuels Treatments by Cover Type (average acres, per year, over the

life of the Land and Resource Management Plan)

Fuels Treatment	Alternative A	Alternative B	Alternative C	Alternative D
Dinggan igninar	500 mastication	500 mastication	500 mastication	500 mastication
Pinyon-juniper 500 prescribed fire 50		500 prescribed fire	500 prescribed fire	500ac prescribed fire
Mixed	500 mastication	500 mastication	500 mastication	500 mastication
shrubland	500 prescribed fire	500 prescribed fire	500 prescribed fire	500 prescribed fire
	500 mastication	500 mastication	500 mastication	500 mastication
Dandarasa nina	500 prescribed fire	500 prescribed fire	500 prescribed fire	500 prescribed fire
Ponderosa pine	200 mechanical	200 mechanical 200 mechanical		200 mechanical
	restoration	restoration	restoration	restoration
Warm dry	500 prescribed fire	500 prescribed fire	500 prescribed fire	500 prescribed fire
mixed conifer	500 mechanical	500 mechanical	500 mechanical	500 mechanical
illixed collifer	restoration	restoration	restoration	restoration
Mixed	1 up to 10,000 fire	1 up to 10,000 fire	1 up to 10,000	1 up to 10,000 fire
	managed for resource	managed for resource	fire managed for	managed for resource
vegetation	benefit	benefit	resource benefit	benefit
	1 up to 10,000 fire	1 up to 10,000 fire	1 up to 10,000	1 up to 10,000 fire
Spruce-fir	managed for resource	managed for resource	fire managed for	managed for resource
	benefit	benefit	resource benefit	benefit

Table F.3: San Juan National Forest Timber Treatment Acres by Cover Type (average acres, per year, over the life of the Land and Resource Management Plan)

Cover Type	Alternative A Alternative B		Alternative C	Alternative D
Dandarasa nina	1,000 Rest*	1,000 Rest*	900 Rest*	1,500 Rest*
Ponderosa pine	500 PC	500 PC	400 PC	500 PC
Warm-dry mixed conifer	250	250 Rest*	200 Rest*	500 Rest*
	Rest* 250 PC	250 PC	225 PC	250 PC
Cool-moist mixed conifer	400 PC	250 PC	40 PC	575 PC
Aspen	400 CC	500 CC	400 CC	600 CC
Spruce-fir	100 PC	100 PC	40 PC	226 PC

<sup>\*</sup> Also counted as mechanical fuels acres.

PC = Partial cut; Rest = Restoration harvest; CC = Clearcut.

Table F.4: Tres Rios Field Office Timber Treatment Acres by Cover Type (average acres, per year, over the life of the Land and Resource Management Plan)

Cover Type	Alternative A	Alternative B	Alternative C	Alternative D
Ponderosa pine	150 Rest*	150 Rest*	130 Rest*	200 Rest*
Warm-dry mixed conifer	25 Rest*	25 Rest*	N/A	40 Rest*
Cool-moist mixed conifer	N/A	N/A	N/A	N/A
Aspen	N/A	N/A	N/A	N/A
Spruce-fir	10 PC	10 PC	4 PC	24 ac PC

<sup>\*</sup> Also counted as mechanical fuels acres.

PC = Partial cut; Rest = Restoration harvest; CC = Clearcut.

Table F.5: Watershed, Riparian, and Aquatic Habitat Improvement Projections by Alternative

Estimated Management	Alternative A	Alternative B	Alternative C	Alternative D	
Activities					
<ul> <li>BLM stream improvements</li> </ul>	1 mile	1 mile	5 miles	0 miles	
• BLM riparian improvements	10 acres	50 acres	100 acres	10 acres	
BLM lake/fen Improvements	1 acre	1 acre	5 acres	0 acres	
• BLM stream structure projects	19 structures	19 structures	30 structures	19 structures	
(new or maintained)	19 Structures	19 Structures	50 Structures	19 Structures	
<ul> <li>BLM riparian and watershed</li> </ul>	11 acres	51 acres	105 acres	10 acres	
improvement	11 acres	31 acres	103 acres	10 acres	
<ul> <li>USFS riparian and watershed</li> </ul>	30 acres	150 acres	300 acres	150 acres	
improvement	30 acres	150 acres	500 acres	150 acres	
<ul> <li>USFS or BLM fish habitat</li> </ul>	6 miles	6 miles	9 miles	5 miles	
enhanced or improved	0 miles	0 miles	) lillies	J iiiies	
•USFS or BLM watershed road					
densities reduced (e.g., road	0 mile	3 miles	10 miles	0 miles	
decommissioning)					

**Table F.6: Wildlife Habitat Improvement** 

Estimated Management Activities	Alternative A	Alternative B	Alternative C	Alternative D
BLM Gunnison's sage grouse	1,500 acres	2,500 acres	2,500 acres	1,000 acres
habitat improvement and				
restoration				
BLM and USFS Nokomis	1 site	2 sites	2 sites	0 sites
fritillary butterfly habitat				
improvement and restoration				
BLM and USFS bat habitat	All	All	All	All
restoration and protection via				
installation of structures				

Estimated Management Activities	Alternative A	Alternative B	Alternative C	Alternative D
associated with mine closures				
USFS inventory and monitor wildlife special status species	3,000 acres	5,000 acres	5,000 acres	2,500 acres
USFS terrestrial wildlife habitat improvement and restoration	1,500 acres	2,000 acres	2,000 acres	1,500 acres
USFS ponderosa pine restoration to support associated wildlife populations	1,000 acres	3,000 acres	3,000 acres	2,000 acres
USFS cool-moist mixed conifer and spruce-fir restoration to support associated wildlife populations	1,000 acres	2,000 acres	2,000 acres	1,000 acres
USFS winter range habitat improvement for big game	1,500 acres	5,000 acres	2,500 acres	1,500 acres
USFS aspen restoration to support associated wildlife populations	1,000 acres	3,000 acres	3,000 acres	1,000 acres

## PROJECTED OIL AND GAS DEVELOPMENT ASSUMPTIONS

The leasing decisions associated with this Land and Resource Management Plan (LRMP) and FEIS include which lands are available for lease and for those lands made available, as well as which stipulations will be applied to mitigate potential impacts from development. The leasing decisions primarily focus on future leases. However, the analysis does consider the potential impacts of new development on already leased lands, as well as cumulative impacts from development of adjacent non-federal mineral development (i.e., private, state, other).

Within the planning area there are three basins with moderate to high potential for mineral occurrence: the Paradox Basin (referred to as the Paradox Leasing Analysis Area [PLAA] for this analysis), the Northern San Juan Basin (NSJB) and the San Juan Sag. This analysis focuses on the PLAA because it is the area with the highest leasing interest within the planning area, as well as having high development potential as reflected in the Reasonably Foreseeable Development projections for the area, and because much of the area is currently unleased and subject to lease after approval of the LRMP. On the basis of these factors, the impacts from oil and gas focus on the PLAA.

The NSJB, primarily on San Juan National Forest (SJNF) lands, also has high potential for development. However, unlike the Paradox Basin, the NSJB is fully leased and developed. Within the NSJB, the remaining question is how to condition further development of existing leases as additional wells are proposed. Anticipated development would involve constructing infill wells on existing, expanded well pads. The analysis of NSJB development and the relation to the revised LRMP decisions is also analyzed in this chapter.

A third area with potential is the San Juan Sag. Given the limited past limited development history in the San Juan Sag, only one to two exploratory wells, annually, over the life of the LRMP are projected for the San Juan Sag. Because of the assumed minimal leasing interest in the San Juan Sag, and minimal development projections, the FEIS does not include a detailed analysis San Juan Sag.

Hence, the following development assumptions focus primarily on the PLAA area, including shale gas development associated with the Gothic Shale Gas Play (GSGP) and conventional oil and gas development. The additional development projected on already leased lands in the NSJB, follow the PLAA assumptions. And lastly, the minor projections for the San Juan Sag are included.

### Paradox Basin Projected Development Assumptions for Shale Gas and Conventional Oil and Gas Development

### Surface Disturbance Assumptions for Conventional Oil or Gas Wells in the Paradox Basin

- Well pad disturbance includes pads, roads and water ponds and construction impacts.
- Average pad disturbance per producing well = 1.6 acres.
- Average road disturbance per well = 2.4 acres/0.5 miles.
- Total surface disturbance per well = 4 acres.

#### Surface Disturbance Assumptions for Shale Gas Wells

- Well pad disturbance includes pads, reserve pits, fresh water storage ponds and construction impacts.
- Average pad disturbance per single well on a single pad = 4.5 acres.
- Average pad disturbance per two wells on single pad = 5.5 acres.
- Forty-four percent (44%) of the development will be on single well/pad locations and 56% will be on two wells/pad location.

- Average road disturbance per well = 2.4 acres/0.5 mile.
- Total surface disturbance single well on a single pad = 6.9 acres.
- Total surface disturbance two wells per pad = 7.9 acres.
- Associated flow lines will be collocated in access road rights-of-way = 0 acres of surface disturbance.
- Downhole well spacing for the GSGP area is assumed to be 160 acres (i.e., four wells per square mile). Pad spacing is assumed to be 320 acres (i.e., two pads per square mile).

#### Assumptions for Well Site-related Surface Disturbance

- One major gas transmission pipeline may be needed as the GSGP develops and is assumed to be located on private surface land.
- Gathering pipelines, compressor stations, and gas processing plants may be needed and are assumed to be located on public (60%) and private surface (40%) land and parallel to an existing pipeline corridor in the area.

#### Disposal of Waste Water and Fracing Material Assumptions (GSGP)

- No evaporative pits would be authorized on public lands.
- At a minimum, waste water would be disposed of according to U.S. Environmental Protection Agency and Colorado Department of Public Health and Environment standards

#### Water Consumption Assumptions

- Water consumption for a <u>conventional well</u> in the Paradox Leasing Area would equal 32,000 barrels (i.e., 1,000,000 gallons or 3.1 acre-feet of water)—plus or minus 25%, meaning that the exact amount is a function of well depth.
- Water consumption for a typical <u>GSGP well</u> would use 100,000 barrels (4,200,000 gallons) of
  water to drill, fracture and complete the well. No water would be obtained from public lands. All
  water would be purchased by the gas companies from private sources. There would be a 40%
  water recycle rate, meaning that 60,000 barrels would be required on average per well after the
  first well is supplied.
  - 100,000 barrels of water = 4,200,000 gallons of water = 12.89 acre-feet of water
  - 60,000 barrels of water = 2,520,000 gallons of water = 7.73 acre-feet of water
  - 8 gas wells to a cluster over 2 sections, since there will be 4 gas wells/section
  - 1st well will need 100,000 barrels or 12.89 acre-feet of water to drill, fracture, and complete
  - 2nd through 8th wells will need 60,000 barrels or 7.73 acre-feet of water to drill, fracture, and complete

The following tables include projections for BLM and National Forest System lands for leased and unleased lands, and for the GSGP area and conventional gas development within the PLAA.

#### Well Pads

Table F.7: Number of Gothic Shale Gas Play and Conventional <u>Well Pads</u> on <u>Unleased</u> Lands in the Paradox Leasing Analysis Area

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF GSGP well pads	342	321	286	341	0
BLM GSGP well pads	122	80	73	111	0
SJNF conventional well pads	110	107	79	109	0
BLM conventional well pads	91	75	65	83	0
Total	665	583	503	644	0

Table F.8: Number of <u>Well Pads</u> Gothic Shale Gas Play and Conventional <u>Leased</u> Lands in the Paradox Leasing Analysis Area

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF GSGP	67	67	67	67	67
BLMGSGP	180	180	180	180	180
SJNF conventional	8	8	8	8	8
BLM conventional	103	103	103	103	103
Total	358	358	358	358	358

Table F.9: Total Conventional and Gothic Shale Gas Play Well Pads On Leased and Unleased Lands in the Paradox Leasing Analysis Area

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF	527	503	440	525	75
BLM resource area	496	438	421	477	283
Total	1,023	941	861	1,002	358

#### Wells

Table F.10: Number of Conventional and Gothic Shale Gas Play Wells on Unleased Lands in the Paradox Leasing Analysis Area by Jurisdiction

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF Unleased Conventional	110	107	79	109	0
BLM Unleased Conventional	91	75	65	83	0
SJNF Unleased GSGP	476	446	401	475	0
BLM Unleased GSGP	172	114	102	156	0
Total	849	742	647	823	0

Table F.11: Number of Conventional and Gothic Shale Gas Play Wells on Leased Lands in the Paradox Leasing Analysis Area by Jurisdiction

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease	
SJNF leased Conventional	8	8	8	8	8	
BLM leased Conventional	103	103	103	103	103	
SJNF leased GSGP	93	93	93	93	93	
BLM leased GSGP	248	248	248	248	248	
Total	452	452	452	452	452	

Table F.12: Total of <u>Combined</u> Conventional and Gothic Shale Gas Play <u>Wells</u> On Leased and Unleased Lands in the Paradox Leasing Analysis Area

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF	687	654	581	685	101
BLM resource area	614	540	518	590	351
Total	1,301	1,194	1,099	1,275	452

#### **Road Miles**

Table F.13: <u>Road Mile</u> Projections, by Jurisdiction on <u>Unleased</u> Lands for Conventional and Gothic Shale Gas Play within the Paradox Leasing Analysis Area, by Alternative

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF road miles conventional	56	53	40	54	0
BLM resource area road miles conventional	45	38	32	41	0
SJNF road miles GSGP	172	161	142	167	0
BLM resource area road miles GSGP	61	40	37	55	0
Total	334	292	251	317	0

Table F.14: Road Mile Projections, by Jurisdiction on Leased Lands for Conventional and Gothic Shale Gas

Play within the Paradox Leasing Analysis Area, by Alternative

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF road miles conventional leased	4	4	4	4	4
BLM resource area road miles conventional leased	50	50	50	50	50
SJNF road miles GSGPleased	40	40	40	40	40
BLM resource area road miles conventional GSGP leased	89	89	89	89	89
Total	183	183	183	183	183

Table F.15: Total Combined Road Mile Projections on Leased and Unleased Lands for Conventional and

Gothic Shale Gas Play within the Paradox Leasing Analysis Area, by Alternative

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
USFS conventional and GSGP					
acres of disturbance	272	258	226	265	44
BLM conventional and GSGP acres					
of disturbance	245	217	208	235	139
Total	517	475	434	500	183

#### **Surface Disturbance**

Table F.16: Total <u>Acres of Disturbance on Unleased</u> Lands for Gothic Shale Gas Play and Conventional Development

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF acres of disturbance conventional	440	425	320	435	0
BLM resource area acres of disturbance conventional	365	300	265	335	0
SJNF acres of disturbance GSGP	2,600	2,440	1,920	2,590	0
BLM resource area acres of disturbance conventional GSGP	925	608	545	805	0
Total	4,330	3,773	3,050	4,165	0

Table F.17: Total <u>Acres of Disturbance on Leased</u> Lands for Gothic Shale Gas Play and Conventional Development

Development					
Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
SJNF acres of disturbance conventional leased	35	35	35	35	35
BLM resource area acres of disturbance conventional leased	410	410	410	410	410
SJNF acres of disturbance GSGP leased	495	495	495	495	495
BLM resource area acres of disturbance conventional GSGP leased	1,370	1,370	1,370	1,370	1,370
Total	2,310	2,310	2,310	2,310	2,310

Table F.18: Total <u>Combined Acres of Disturbance</u> on Leased and Unleased Lands for Conventional and Gothic Shale Gas Play w/in the Paradox Leasing Analysis Area, by Alternative

Jurisdiction	Alt A	Alt B	Alt C	Alt D	No Lease
USFS conventional and GSGP	3,570	3,395	2,770	3,555	530
acres of disturbance					

BLM conventional and GSGP acres of disturbance	3,070	2,688	2,590	2,920	1,780
Total	6,640	6,083	5,360	6,475	2,310

Table F.19: Cumulative Gas Development – Paradox Basin Planning Area (including Draft Environmental Impact Statement projections for the Paradox Basin and the new Gothic Shale Gas Play area projections)

	FEDERAL LEASES			PRIVATE AND STATE LEASES			
	Number of well	Miles of	Total acres of	Number of well	Miles of	Total acres of	
	pads	road	disturbance	pads	road	disturbance	
Existing wells	171	87	≈ 680	90	≈ 45	≈ 360	
GSGP - projected on federal leases	659	324	4,368				
Conventional - projected on federal	293	147	1,630				
leases							
GSGP projected on private and				485	≈ 242	≈ 3,590	
state							
Conventional projected on private				50	≈ 25	≈ 200	
and state mineral estate							
Total	1,123	558	6,678	625	312	4,150	
Other infrastructure requirements: gathering lines, compressor stations, gas processing plants	1						
National Forest System and BLM			275				
administered lands							
Private and state mineral estate						455	
Total			6,953			4,605	

### Northern San Juan Basin Development Projections and Assumptions

- All conventional oil or gas wells and coalbed methane (CBM) wells, for both the USFS and BLM, are projected to occur on already leased lands, and thus are the same for all alternatives.
- Water consumption for a <u>coal-bed methane well in the NSJB</u> is assumed to use 5,072 barrels (i.e., 160,000 gallons or 0.5 acre-feet of water) per well.
- Water consumption for a conventional well in NSJB and in the San Juan Sag is assumed to use 12,680 barrels (i.e., 400,000 gallons or 1.2 acre-feet of water) per well.

Table F.20: Projections for the Northern San Juan Basin by Jurisdiction

	USFS	BLM
CBM well pads on existing leases	255	84
CBM miles of road	70	14
CBM acres of disturbance	585	165
Conventional well pads	30	10
Conventional miles of road	0	0
Conventional acres of disturbance	15	5

#### San Juan Sag Development Projections and Assumptions

- All conventional oil or gas wells in the San Juan Sag are projected to occur on SJNF lands; no development is projected in the San Juan Sag for BLM lands.
- Projections are the same for all alternatives, as historically the San Juan Sag has not resulted in many productive wells, and thus the analysis has been simplified.

Table F.21: Future Development Projections for the Northern San Juan Basin by Jurisdiction

	U	SFS	BLM
	Leased	Unleased	
Well pads	5	25	0
Miles of road	2	12	0
Acres of disturbance	20	100	0

#### STIPULATIONS BY ALTERNATIVE FOR FEIS ANALYSIS

The table below illustrates the range of stipulations by alternative that were used for analysis in Chapter 3 of the FEIS. Alternative A was defined by the current USFS and BLM land management plans, as well as the 1991 Colorado oil and gas leasing availability decision, and standards and guidelines in the current LRMP. Alternative B represents the stipulation identified for the Preferred Alternative and are detailed in Appendix H, Leasing Stipulations. Alternatives C and D were developed based on the theme of those alternatives, i.e., generally Alternative C is more restrictive and Alternative D is less restrictive. For some resource stipulations, Alternative C may indicate fewer stipulated acres than the other alternatives. This primarily occurs because Alternative C has made the area or resources within the areas, not available for lease. Lease notices are not included in this table.

The following acronyms are used in the table.

- SLT- Standard Lease Terms
- TL-Timing Limitation
- CSU-Controlled Surface Use
- NSO-No Surface Occupancy
- NAL-Not Available for Lease
- PLAA-Paradox Leasing Analysis Area

Additionally, the table identifies the amount of acres for each alternative. Alternatives A, B, C, and D columns identify the acres unit wide (i.e., SJNF and Tres Rios Field Office [TRFO] federal mineral estate); and the PLAA column identifies acres affected within that basin specifically. Acres are not available for resource stipulations that are not mapped. Resources not mapped are indicated with an asterisk. Acres for the PLAA are specifically identified because it is the area where the greatest amount of development is projected to occur over the life of the LRMP, and thus analysis of potential impacts to and from oil and gas development focus upon this area. The Hydrocarbon Occurrence Potential and Prospective Basins map in Appendix V identifies the location of the PLAA.

Table F.22: Stipulations by Alternative Planning Area Wide and for the Paradox Leasing Analysis Area

Resources	SJNF and TRFO Lease				Paradox Leasing Analysis Area affected acres
W	Alt A	Alt B	Alt C	Alt D	
Water and Soil	SLT	NCO 17 160	NIAI 14550	CCII 17 104	A ==/a
Municipal Watersheds and Public Water Supply Lands within 1,000 horizontal feet of either side of a classified surface	SLI	NSO – 17,168	NAL – 14,558	CSU – 17,194	A - n/a B - 5562
water supply stream segment (as measured from the average high water					C – 5206
mark of a water body) for a distance of five (5) miles upstream of a					D – 5588
public water supply intake with the classification "Water Supply"					D - 3388
Municipal Watersheds and Public Water Supply  Municipal Watersheds and Public Water Supply	SLT	CSU – 15,768	NAL – 12,366	SLT	A - n/a
Oil and Gas operations located greater than 1,000 horizontal feet but	SLI	C30 - 13,708	NAL - 12,300	SLI	B – 4662
less than 2300 horizontal feet of a classified surface water supply					C – 3652
stream segment (as measured from the average high water mark of a					D - n/a
water body) for a distance of five (5) miles upstream of a public water					В пи
supply intake with the classification "Water Supply"					
Major River Corridors: Prohibit surface occupancy and surface-	SLT	NSO - 72,358	NSO – 28,508	CSU - 78,501	A - n/a
disturbing activities within stream channels, stream banks, and the area		,	,	,	B - 55,406
2,500 horizontal feet either side of the ordinary high-water mark (bank-					C – 19,766
full stage).					D – 61,124
Perennial Streams, Water Bodies, Riparian Areas and Fens:	NSO – 213,414	NSO – 211,602	NSO – 127,499	CSU – 215,023	A – 98,925
Prohibit surface occupancy and surface disturbing activities within a					B - 98,940
minimum buffer distance of 325 horizontal feet for all perennial					C – 67,257
waters. See Stip for full description of distances where NSO applies.					D – 99,942
<b>Perennial Streams, Water Bodies, Riparian Areas and Fens</b> : From	CSU – 110,137	CSU – 104,074	CSU – 67,462	SLT	A - 53,051
325 to 500 horizontal feet from the perennial water body, controlled					B - 51,842
surface use restrictions will apply. See Stip for full description of					C - 37,537
distances where NSO applies.					D - n/a
Intermittent and Ephemeral Streams*: NSO of 50 horizontal feet as	SLT	NSO	NSO	SLT	*
measured from the top of the stream bank for all intermittent or					
ephemeral streams (see stipulation for diagram and full details).	CI T	COLL	NGO	OL T	*
<b>Intermittent and Ephemeral Streams*</b> : CSU from the edge of NSO buffer to 100 horizontal feet.	SLT	CSU -	NSO	SLT	*
Jurisdictional Dams*	NSO	NSO	NSO	NSO	*

Resources	Si	SJNF and TRFO Lease Stipulations for Entire Planning Area				
	Alt A	Alt B	Alt C	Alt D		
<b>Groundwater Resources (Shallow)*</b> : Oil and gas surface operations over shallow (<2,000 feet) potentially usable groundwater (<10,000 TDS) shall use be subject to protection measures (see stipulation for full details)	SLT	CSU	CSU	SLT	*	
Groundwater Resources*: Oil and gas operations using multi-stage hydraulic fracturing shall be subject to protection measures to protect potentially usable water bearing intervals (see stipulation for full details)	SLT	CSU	CSU	SLT	*	
<b>Reservoirs and Lakes</b> : For reservoirs and lakes one acre or larger as measured by the high water mark, no surface occupancy will be allowed within 1/4 mile of the high water shoreline.	NSO - 3943	NSO - 3912	NSO - 1725	CSU - 3943	A – 1340 B – 1340 C – 836 D – 1340	
Slopes Greater than 35 Percent	NSO slopes >40%	NSO Slopes >35%	NSO Slopes >35%	CSU	A – 173,265 B – 213,139 C – 114,069	
	450,068	521,795	234,950	567,995	D - 223,700	
Slopes of 25 to 35 Percent * and shale soils	SLT	CSU – 238,391	NSO – 183,171	SLT	A - n/a B - 166,569 C - 128,749 D - n/a	
Lands Prone to Mass Movement	NSO – 47,086	NSO – 46,983	NSO – 19,871	CSU – 47,385	A – 7788 B – 7788 C – 5814 D – 7788	
Gypsum Soils	SLT	CSU – 6215	NSO – 50,787	SLT	A - n/a B - 6033 C - 45,973 D - n/a	
Biological Soil Crust*	SLT	CSU	NSO	SLT	*	
Fruitland Formation Outcrop Zone Check acres	CSU 22,699	CSU 21,797	CSU 22,699	CSU 22,699		

Resources	Si	SJNF and TRFO Lease Stipulations for Entire Planning Area			
	Alt A	Alt B	Alt C	Alt D	
Vegetation and Plants					
Threatened, Endangered, Proposed, and Candidate Plant Species	NSO – 14,133	NSO – 13,367	NSO - 6352	NSO – 14,228	A - 4713
(partially mapped)					B - 4713
					C – 2859
	GT -	0011	3.70.0	a	D – 4714
Sensitive Plants *	SLT	CSU	NSO	SLT	*
Special Botanical Areas	NSO – 276	NSO - 664	NSO - 664	CSU - 664	A - 0
	CSU - 388				B-0
					C-0
December 1 Notes 1 Access For 1 december 2 and 1 December 2	NSO - 2456	NGO 12 205	NIAI (0.452	NSO - 7834	D – 0 A – 1971
Research Natural Areas- Existing and Proposed	NSO - 2430	NSO – 12,395	NAL – 68,453	NSO - /834	B – 5219
					C – 7699
					D – 1971
Old Growth Forests and Woodlands	SLT	NSO 24,955	NSO – 36,982	CSU – 24,954	A - n/a
ord Growth I Gross and Woodings	521	1100 21,555	1100 30,302	21,,,,,	B - 2478
					C – 11,158
					D - 2478
Wildlife and Aquatics					
Mexican Spotted Owl	NSO – 49,069	NSO – 49,065	NSO – 43,683	NSO - 49,240	A - 49,070
-					B - 49,065
					C - 43,683
					D – 49,240
Lynx, Landscape Linkage, Denning and Winter Foraging Habitat	TL – 488,024	CSU – 435,924	CSU – 206,745	CSU – 488,199	A – 153,577
					B - 148,424
					C – 69,547
					D – 153,581
<b>Lynx Denning Sites</b> : Within one mile of known, active, den sites (not mapped)	TL	TL	TL	TL	
Southwest Willow Flycatcher: No surface occupancy within 325 ft of	NSO - 1169	NSO - 1169	NSO - 809	NSO - 1169	A - 0
ordinary high watermark in mapped habitat.					B-0
					C-0
					D-0

Resources	St	SJNF and TRFO Lease Stipulations for Entire Planning Area			
	Alt A	Alt B	Alt C	Alt D	
<b>Southwest Willow Flycatcher</b> : No surface use is allowed during May1-Aug. 15 mapped in suitable nesting habitat.	TL - 433	TL - 433	TL - 266	TL - 433	A - 0 B - 0 C - 0 D - 0
Gunnison Sage-grouse Proposed Occupied Critical Habitat to protect habitat and species.	NSO ½ mi. of lek sites 1,909	NSO – 65,531	NAL – 65,531	NSO – 65,531	A – 65,531 B – 65,531 C – 65,531 D – 65,531
Gunnison Sage-grouse Proposed Occupied Critical Habitat to reduce habitat fragmentation or loss of habitat	SLT	CSU- 65,531	CSU- 65,531	CSU- 65,531	A – n/a B - 65,531 C - 65,531 D - 65,531
Gunnison Sage-grouse Proposed Unoccupied Critical Habitat	N/A	CSU – 50,682	NSO – 50,682	CSU – 50,682	$\begin{array}{c} A - n/a \\ B - 41,810 \\ C - 41,810 \\ D - 41,810 \end{array}$
Gunnison Sage-grouse – Noise Restriction in Proposed Occupied and Unoccupied habitat	N/A	CSU – 117,125	CSU – 117,125	CSU – 117,125	A - n/a B - 107,342 C - 107,342 D - 107,342
Columbian Sharp-tailed Grouse Lek Site: No surface occupancy is allowed within 0.4 miles buffer of a lek.	TL - 258	NSO - 258	NSO - 258	TL - 258	A – 258 B – 258 C – 258 D – 258
Columbian Sharp-tailed Grouse Noise Restrictions (partially mapped)	SLT	CSU - 1992	NSO - 1992	CSU - 1992	A - n/a B - 1992 C - 1992 D - 1992
Colorado River Cutthroat Trout	NSO – 26,502	NSO – 25,492	NSO - 7924	CSU – 26,536	A – 824 B – 824 C – 486 D – 824

Resources	St	SJNF and TRFO Lease Stipulations for Entire Planning Area			
	Alt A	Alt B	Alt C	Alt D	
Greenback Cutthroat Trout:	NSO - 8136	NSO - 4068	NSO - 6226	NSO - 8137	A – 8136
					B - 4068
					C - 6226
					D – 8137
Eagles, All Accipiters, Falcons, Buteos, and Owls: Within specified	NSO – 61,431	NSO – 61,426	NSO – 69,650	NSO - 62,178	A – NSO –
distance from nest and communal winter roost sites. See Stip and Table	TL - 61,431				27,884
H-1: Raptor Conservation Measures.					A – TL –
					27,885
					B - 27,879
					C – 43,796
					D – 28,621
Eagles, All Accipiters, Falcons, Buteos, and Owls:	NSO – 61,431	TL - 61,426	NSO – 69,655	TL - 62,178	A – NSO –
A timing limitation will be applied to all development activities See	TL – 61,431				27,884
Stip and Table H-1: Raptor Conservation Measures.					A – TL –
					27,885
					B – 27,879
					C – 43,796
DI C D I III	TDI 442.615	TDT 440 401	3100 240 506	OL T	D – 28,621
Big Game Parturition	TL – 443,615	TL – 442,431	NSO – 240,506	SLT	A – 310,005
					B – 310,063
					C – 178,768
P'- C W'- d P CCU d id- Cidid id-	SLT	CSU-	CSU-	SLT	D - n/a
Big Game Winter Range CSU to provide for healthy ungulate	SLI			SLI	A - n/a
populations		1,869,453	2,148,396		B – 1,331,921
					C – 1,495,410 D –n/a
Big Game Winter Range: No surface use is allowed in mapped winter	TL – 1,636,005	TL – 1,635,533	NSO –	SLT	A – 1,194,278
range areas during species specific time period(s)	1L - 1,030,003	11 - 1,055,555	1,461,760	SLI	B – 1,194,051
range areas during species specific time period(s)			1,401,700		C – 1,053,544
					D - n/a
					υ 11/α
Gunnison Prairie Dog	SLT	CSU - 338,762	CSU – 262,710	SLT	A – n/a
		220 220,702	202,710	221	B - 248,201
					C – 175,834
					D - n/a

Resources	S	SJNF and TRFO Lease Stipulations for Entire Planning Area			
	Alt A	Alt B	Alt C	Alt D	
Bats*: NSO within one-quarter mile radius of known maternity roosts	SLT	NSO	NSO	SLT	*
or hibernacula of BLM and Forest Service sensitive bat species.					
State Wildlife Areas: Bodo SWA, Dan Noble SWA, Dry Creek SWA,	SLT	NSO – 22,920	NAL – 22,920	CSU – 22,920	A - n/a
Lone Cone SWA, Lone Dome SWA, Perins SWA (and BLM lands to					B - 18,512
comprise HMA), Puett Reservoir SWA, Williams Reservoir SWA,					C – 18,512
Coalbed Canyon SWA, Devil Creek SWA, Fish Cr. SWA, Haviland					D – 18,512
SWA, and Joe Moore SWA. Check acres.					
Cultural, Historic, Recreation and Visual Stips	1	<u> </u>	T	T	
Cultural Resources	NSO - 941	NSO - 23,775	NAL – 23,775	NSO – 23,775	A - 0
National Register Districts: Lost Canyon, Spring Creek					B - 8170
• Proposed National Register Districts: Saul's Creek, Turkey					C – 8170
Creek, Armstrong Ritter					D – 8170
Mesa Verde Escarpment					
Anasazi remnant, aka Anasazi Archeological Areas					
Bull Canyon Rock Shelter					
Indian Henry's Cabin					
Horse Range Mesa Paleontological Site	NSO - 981	NSO - 981	NSO - 979	CSU - 981	A – 981
					B - 981
					C – 979
					D – 981
View Shed, Auditory and Night Sky Protection for Chimney Rock	SLT	NSO – 48,684	NAL - 60,115	CSU – 48,957	A - n/a
Archeological Area					B - 18
					C – 18
					D – 18
View shed for the Glade Guard Station, and Aspen Guard Station	SLT	CSU - 873	NSO - 898	SLT	A – n/a
					B - 873
					C – 898
					D - n/a
Old Spanish Trail: No surface-disturbing activities up to ½ mile of	SLT	NSO	NSO	NSO	A – n/a
either side of the centerline of the congressionally designated trail in		½ mi 5388	5 mi.	½ mi 5388	B – 4146
high potential segments.			125,533		C – 82,417
					D – 4146

Resources	St	SJNF and TRFO Lease Stipulations for Entire Planning Area			
	Alt A	Alt B	Alt C	Alt D	
<b>Old Spanish Trail-Visual*</b> : CSU for the horizon on either side of the centerline of the congressionally designated trail in high potential segments.	SLT	CSU	CSU	SLT	*
<b>Developed Administrative and Recreation Sites</b> : Within one-quarter mile around developed administrative and/or recreation sites.	NSO – 27,874	NSO – 27,942	NSO – 21,184	NSO – 28,088	A - 6362 B - 6411 C - 4356 D - 6529
<b>Developed Administrative and Recreation Sites</b> : Surface use or occupancy will be prohibited unless the operator demonstrates that operations can be acceptably conducted within one mile of developed administrative and recreation sites.	CSU – 322,423	CSU – 286,088	NSO – 201,675	SLT	A – 98,661 B – 93,993 C – 71,916 D – n/a
Special Recreation Management Areas: BLM SRMAs: Durango, Dolores River Canyon, Silverton, Cortez	SLT	CSU – 80,866	CSU – 92,011	SLT	$\begin{array}{c} A - n/a \\ B - 36,661 \\ C - 42,136 \\ D - n/a \end{array}$
National Scenic Byways, All American Roads and Backcountry Byways, Designated Scenic, Recreation and Historic Trails and Recreation-Emphasis Corridors: Within the identified foreground viewshed, up to one-half mile on either side of the following: San Juan Skyway, Trail of the Ancients, the Alpine Loop Back Country Byway, Old Spanish Trail, Continental Divide Trail, Colorado Trail, Calico Trail, Highline Loop Trail, East Fork Road, West Fork Road, First Notch Road, Piedra Road, Poison Park Road, Lime Creek Road, South Mineral Road, La Plata Canyon Road, West Dolores Road, and Durango-Silverton Narrow Gauge Railroad.	NSO – 114,771 CSU – 74,952	NSO – 185,524	NSO – 96,369	CSU – 190,170	A – NSO – 42,951 A – CSU – 31,442 B – 74,000 C – 37,486 D – 75,452
High Scenic Integrity Objective and Visual Resource Management Class II Areas (partially mapped)	CSU – 349,211	NSO – 334,283	NSO – 134,740	SLT	A – 128,537 B – 121,851 C – 54,027 D – n/a
Area Specific					
SJNF Colorado Roadless Areas	NSO – 564,754	NSO – 557,810	NAL	NSO – 566,010	A – 145,335 B – 145,393 C – n/a D – 145,393

Resources	SJNF and TRFO Lease Stipulations for Entire Planning Area				Paradox Leasing Analysis Area affected acres	
	Alt A	Alt B	Alt C	Alt D		
TRFO Lands managed for their Wilderness Characteristics	SLT	NSO – 11,867	NAL – 36,574	SLT	A - n/a	
					B – 11,867	
					C - 36,574	
					D – n/a	
<b>Dolores River Canyon</b>	NSO	NSO	NAL – 43,934	NSO – 37,277	A - 29,490	
	29,490	39,275			B - 39,275	
					C – 43,934	
William to Discount of the Control o	NGO (722	NGO 10.530	NGO 7406	NGO	D – 37,277	
Wild Scenic Rivers - Scenic Segments	NSO - 6732	NSO – 19,538	NSO - 7406	NSO – n/a	A – 6732	
					B – 10,376 C – 5359	
					D - n/a	
Spring Creek Wild Horse Herd Foaling Area: Protecting wild horse	TL – 15,006	TL – 15,006	CSU - 8487	TL – 15,006	A - 15,006	
foaling April 1-July 31.	1L - 15,000	11 - 13,000	CSU - 6467	112-15,000	B – 15,006	
Touring April 1-July 51.					C – 8487	
					D - 15,006	
Spring Creek Wild Horse Herd Management Area-Water Sources:	SLT	CSU - 5942	CSU - 3215	SLT	A - n/a	
No motorized or surface-disturbing activities within a 2,000-foot radius	521	000 03.2	000 0210	521	B – 5942	
around the mapped water sources in the Spring Creek Basin Herd					C – 3215	
Management Area, including the approximately 15 earthen reservoirs,					D - n/a	
undeveloped springs and one water catchment.						
Management Area 1 – Natural Processes Dominate-SJNF only	NSO - 1046	NSO - 62,951	NSO - 484	NSO – 16,819	A - 0	
					B - 2906	
					C - 482	
					D – 482	
Developed Downhill Ski Areas (including Management Area 8 on	NSO – 15,566	NSO - 6174	NSO - 2156	NSO – 13,585	A - 324	
SJNF lands)					B-7	
					C – 7	
					D – 12	
*Resource not mapped.						

### **Appendix G**

Climate Change Trends and Management Strategy for the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan

## APPENDIX G: CLIMATE CHANGE TRENDS AND MANAGEMENT STRATEGY FOR THE SAN JUAN NATIONAL FOREST AND TRES RIOS FIELD OFFICE LAND AND RESOURCE MANAGEMENT PLAN

The principle components of "climate" are the air temperature and precipitation that characteristically prevail in a region. Although our understanding of climate change in the planning is evolving, we do know that the observed temperature record in southwest Colorado shows average annual warming of about 2 degrees Fahrenheit over the past 30 years. Additional warming is predicted for the future (Western Water Assessment 2008). In comparison, the observed precipitation record in Colorado does not show long-term trends in annual precipitation. This is due to the wide variations in elevation and complex terrain of Colorado, which complicate past and future precipitation trend analysis (Western Water Assessment 2008).

Because we do not understand every complex interaction between a warming climate and the ecosystems of the San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO), the vision and strategies for climate change in the Land and Resource Management Plan (LRMP) focus primarily on ecosystems that have already demonstrated sensitivity or are considered most at risk because we are already observing changes. In the short term, we plan to continue improving our understanding of ecosystem changes. We also intend to pursue long-term monitoring projects. We do know there are many flora and fauna populations that are vulnerable because of their narrow range of habitat, small populations, or limited ability to adapt or tolerate change. Specific strategies have been developed for these vulnerable species, as well as for important ecosystems that are already undergoing rapid change.

#### **Changes Already Observed**

Between 2000 and 2005 sudden aspen (*Populus* sp.) decline has been prevalent in the planning area and has damaged over 17% of aspen forests in Colorado. This phenomenon is considered a different change compared to usual dynamic changes observed in aspen forests over the last hundred years. Aspen in the planning area has exhibited widespread, severe, rapid dieback and mortality at a landscape level over just a few years. On the Dolores Ranger District about 40,000 acres of aspen on public lands were affected. Exceptionally warm, dry conditions have weakened aspen growing on south and west aspects, low elevations, and in open stands. The stressed trees have become vulnerable to secondary insects and disease that have killed the trees over large areas (U.S. Forest Service [USFS] 2009).

Another recent ecosystem change has been the widespread and unprecedented episode of pinyon pine (*Pinus ponderosa*) mortality in the Southwest and the planning area. Between 2002 and 2005, millions of pinyon pine trees were killed by pinyon Ips bark beetles (*Ips confusus*) (Allen-Reid et al. 2008). Several years of warm-drought conditions are considered a major factor facilitating the epidemic of pinyon Ips bark beetle.

Climate is driving other landscape changes. River runoff in the planning area is primarily driven by snowmelt. The warming climate from 1978 to 2004 has caused the onset of spring snowpack melt and river snowmelt runoff to occur 2 to 3 weeks earlier in southwest Colorado (Clow 2007). Changes in the timing and amount of runoff are likely to add more stress and demand to available water supplies and may impact aquatic ecosystems. The incidence of wildfire has also changed due to increased spring and summer temperatures and an earlier onset of spring snowmelt. Since the 1980s large wildfires across the western United States have occurred with increased frequency, the duration of the fires has increased, and the length of wildfire season has increased (Westerling et al. 2006).

#### **Species and Habitats Most At Risk**

Climate change is also hydrologic change. Of particular concern are seasonal springs, seeps, small ponds, and small wetlands that occupy less than 1% of the SJNF and TRFO. Rare plant species that are dependent on these small water features include Kachina daisy (*Erigeron kachinensis*) and Eastwood's monkeyflower (*Mimulus eastwoodiae*), which are Bureau of Land Management (BLM) sensitive species; giant helliborine (*Epipactis gigantea*), which is a USFS sensitive species; and common maidenhair (*Adiantum capillus-veneris*). The critically imperiled Great Basin silverspot butterfly (*Speyeria nokomis nokomis*), which is a BLM and USFS sensitive species, and its host plant the bog violet (*Viola nephrophylla*) are also dependent on these small water features. There is also a general concern about protecting hanging garden plant communities that are associated with seeps in alcoves and on canyon walls.

Alpine ecosystems are also changing with the earlier onset of spring snowmelt, warmer temperatures, and the upward encroachment of tree and subalpine plant species (Clow 2007; Moir et al. 1999; Crawford et al. in review). Uncompander fritillary butterfly (*Boloria acrocnema*), white-tailed ptarmigan (*Lagopus leucura*), American pika (*Ochotona princeps*), and many alpine plant species are vulnerable as alpine habitat is impacted or lost.

Spruce-fir forests are currently exhibiting an insect and disease epidemic moving generally from east to west at higher elevations of the Weminuche wilderness at a scale that may be uncharacteristic. Old stand age combined with warmer winters and summers and perhaps a long fire suppression history may be contributing factors to the epidemic. The fact that many insect and disease agents are working simultaneously at a large scale to kill several species of trees also seems outside the norm. This epidemic includes *Armillaria* root disease, which weakens/kills true firs (*Abies* sp.); fir engraver beetle (*Scolytus ventralis*), which kills white fir (*A. concolor*); balsam fir bark beetle (*Pityokteines sparsus*), which kills subalpine fir (*A. lasiocarpa*); and spruce bark beetle (*Ips typographus*), which kills Englemann spruce (*Picea engelmannii*).

Coldwater fish species, especially native lineage greenback cutthroat trout (*Oncorhynchus clarki stomias*), a U.S. Fish and Wildlife Service (USFWS)-listed threatened species, and Colorado River cutthroat trout (*O.c. pleuriticus*) a USFS sensitive species, may be especially vulnerable to increasing water temperatures and hydrologic changes such as reduced late-season base flows. Changes in physical hydrology may actually favor some non-native or invasive aquatic species and may increase the incidence of disease such as whirling disease, adding more stress to these endangered and sensitive aquatic species.

Changing climate may favor many invasive species that can outcompete and displace native species. Of special concern are highly competitive invasive annual plant species such as cheatgrass (*Bromus tectorum*), which already occupies hundreds of acres of the SJNF and TRFO, and is actively moving into higher-elevation ecosystems. Continued drought combined with high-intensity wildfires would likely provide increased opportunities for annual weed spread and establishment.

#### **Our Strategy**

Maintaining the health, diversity, and productivity of the SFNF and TRFO is a primary mission. Our response to ecosystem change as a result of climate change includes a variety of adaptation and mitigation strategies. Our primary strategy is to manage for healthy, resilient ecosystems. It is also recognized that ecosystems have always been dynamic. Early detection of ecosystem changes that result from climate change would require detailed, regularly scheduled monitoring.

Desired conditions and objectives for climate change are interrelated with managing for healthy ecosystems. LRMP components related to climate change are dispersed throughout the resource sections of the LRMP and are also listed below:

#### Terrestrial Ecosystems

#### **Desired Conditions**

- 2.2.2 Non-climate ecosystem stresses (e.g., high road densities, water depletions, air and water pollution) are reduced to improve the resilience and resistance of ecosystems to the future dynamics of a changing climate.
- 2.2.3 Key ecosystems that are not functioning properly are realigned/restored/renovated to survive the near-future dynamics of changing climate.
- 2.2.4 Future biodiversity, especially for endangered, rare, or dwindling species, is protected in the face of a changing climate by safeguarding habitats, preserving genetic diversity, and cooperating with seed banking efforts that provide secure, long-term storage of plant genetic resources.
- 2.2.11 Canyon escarpments, and the terrestrial ecosystems that occur on them, serve as refugia for native biota. These escarpments are associated with the following canyons: Lower Dolores River, Wild Steer, Coyote Wash Spring, McIntyre, Summit, Big Glade, Lake, Doe, Narraguinnep, Cabin, Ferris, Salter, Spruce Water, and Lost. They also include the Mesa Verde Escarpment.
- 2.2.15 Forested terrestrial ecosystems have stand structures and tree species compositions that offer resistance and resilience to changes in climate, including extreme weather events or epidemic insect and disease outbreaks.
- 2.2.16 Non-forested terrestrial ecosystems have community structure and species composition that offer resistance and resilience to changes in climate, including extreme weather events or epidemic insect and disease outbreaks
- 2.2.17 Local seeds of desirable native plant species are available for revegetation and restoration efforts.
- 2.2.18 Suitable habitats for species vulnerable to climate change exist and serve as seed sources for revegetation and restoration efforts.
- 2.2.19 The SJNF and TRFO forested ecosystems provide net positive carbon storage.
- 2.2.20 Five-needle pine species (southwestern white pine [*Pinus strobiformus*], limber pine (*P. flexilis*], and bristlecone pine (*P. aristata*]) are maintained as a component of forested ecosystems.
- 2.2.21 High-elevation stands dominated by aspen will be maintained or increased over time to ensure the persistence of aspen on the landscape in light of declining aspen health and loss of aspen in lower elevations associated with a warmer and drier climate.
- 2.2.36 Long-term levels of soil organic matter and soil nutrients (including soil carbon) are maintained at sustainable levels.

#### **Objectives**

- 2.2.45 Within 10 years, restore or improve soil productivity and soil carbon on at least 20 miles of road that would be closed or decommissioned on the SJNF, and 5 miles of road that would be closed or decommissioned on TRFO lands.
- 2.2.51 Over the next 15 years, manage 2,000 acres of high-elevation aspen stands on SJNF lands that are conifer dominated or at risk of converting to conifer-dominated stands to maintain or increase aspen forests.

- 2.2.57 Over the next 15 years, secure a reliable source of local seed stock for 16 or more native grass, forb, and shrub species (including Arizona fescue [Festuca arizonica]) to be used for revegetation and restoration after disturbance (eight species on the SJNF and eight species on TRFO lands).
- 2.2.58 Over the life of the LRMP, collect seed from 20 local vulnerable grass, forb, and shrub species, including some alpine species, for long-term storage to protect genetic sources (10 species on the SJNF and 10 species on TRFO lands).
- 2.2.59 Use locally produced biochar to sequester carbon, reduce erosion, and enhance soil productivity and water retention on a minimum of 1 acre per year (0.5 acre per year on the SJNF and 0.5 acre per year on TRFO lands) for five years.
- 2.2.60 After natural disturbance events or on restoration projects over the next 15 years, increase the variety of native non-commercial tree species and native shrubs used on a minimum of 100 acres (75 acres on the SJNF and 25 acres on TRFO lands).
- 2.8.61 Over the next 15 years, broaden tree seed collection activities on the SJNF to include noncommercial species and additional species specific elevation zones to improve genetic diversity and the resilience of forested ecosystems.
- 2.2.62 Over the next 15 years, revegetate and reclaim 10 acres using native early-successional plant species developed from local plant sources to accelerate restoration success (5 acres on SJNF and 5 acres on TRFO lands).
- 2.2.63 Over the next 20 years, enhance the resiliency of alpine ecosystems and provide refugia for alpine-dependent species on 100 acres of TRFO lands through implementing travel management decisions in the Alpine Loop zone, implementing recreation management plans, completing mine land reclamation, or conducting other management activities.
- 2.2.64 Over the next 20 years, enhance the resiliency of alpine ecosystems and provide refugia for alpine-dependent species by removing non-climate stressors that result in adverse impacts to alpine ecosystems (e.g., unmanaged livestock grazing, unmanaged motorized recreation) from 100 acres on the SJNF that are forb-dominated alpine habitat.

#### **Guidelines**

- 2.2.81 Management activities should not decrease the abundance or distribution of southwestern white, limber, or bristlecone pine trees in order to maintain white pine species in SJNF and TRFO forested environments.
- 2.2.86 Revegetation and reforestation plans or activities should consider the following strategies to maintain or improve resilience of forested and non-forested ecosystems:
  - use a variety of species and phenotypes;
  - emphasize use of native species, collected locally;
  - use both commercial and non-commercial species for reforestation (non-commercial species include southwestern white, limber or bristlecone pine);
  - use seed collected from across the range of climate zones.

#### Terrestrial Wildlife

#### **Desired Conditions**

2.3.11 Habitat continuity and travel corridors exist and persist to facilitate species movement and establishment into newly suitable areas as a result of changing habitats.

#### Riparian Area and Wetland Ecosystems

#### **Desired Conditions**

2.4.5 Riparian area and wetland ecosystems are resilient to change from disturbances (including from floods, fire, and drought) and offer resistance and resilience to changes in climate.

#### **Objectives**

2.4.18 Maintain or restore native riparian ecosystems and connected uplands that have been treated to control non-native species on a minimum of 50 miles on the Dolores River and its tributaries on TRFO lands over the next 20 years.

#### Aquatic Ecosystems and Fisheries

#### **Desired Conditions**

- 2.5.1 Long-term sustainability of aquatic ecosystems is maintained.
- 2.5.3 The quantity and quality of aquatic habitats are maintained or enhanced to provide for the long-term sustainability of biological diversity and population viability of all native and/or desired non-native vertebrate species.
- 2.5.4 Channel characteristics, water quality, flow regimens, and physical habitat features are diverse and appropriately reflect the climate, geology, and natural biota of the area.

#### Water

#### **Desired Conditions**

2.6.11 Administrative and permitted activities on the SJNF and TRFO do not contribute to the reduction of surface water or groundwater that supplies seasonal springs, seeps, small ponds, and small wetlands considered most vulnerable to a changing climate.

#### **Objectives**

2.6.28 Over the next 10 years, improve the efficiency of water and energy use at all administrative facilities on the SJNF by using the minimum consumption practicable.

#### **Invasive Species**

#### **Desired Conditions**

2.8.5 Management activities do not contribute to the spread of invasive annual plants or other invasive species.

#### **Objectives**

2.8.9 Over the life of the LRMP eradicate newly established invasive species, especially Colorado Class A noxious species on both SJNF and TRFO lands.

#### **Timber Management and Special Forest Products**

#### **Desired Conditions**

- 2.9.1 Forest vegetation management on SJNF and TRFO lands that results in, among other objectives, meeting needs or demands for forest product offerings (commercial, personal, or other use) would be done in a manner that:
  - maintains or improves ecosystem function, resilience, and sustainability;
  - supports, at least, the current level of economic activity in the local timber industry;
  - provides economic or social support to local communities;
  - ensures current and future needs for Native American tribal use, including that associated with special forest products (e.g., teepee poles);
  - utilizes, to the fullest extent practicable, potential products including sawtimber, poles, topwood, or slash (like limbs, foliage);
  - supports innovation in utilization, including conversion of cut-tree mass into biofuels, pellets, biochar, or other useful products;
  - efficiently balances or reduces costs of implementation of treatment activities; and
  - anticipates climate-related plant succession changes (such as favoring heat- or drought-resistant tree species as leave trees, or in reforestation)
- 2.9.4 Reforestation activities on SJNF and TRFO lands use native tree species germinated from locally collected seed stock to improve the resiliency of forest ecosystems.

#### **Objectives**

- 2.9.9 Every 3 years review silvicultural prescriptions for incorporation of strategies that anticipate potential plant succession changes relative to warmer and/or drier forested conditions.
- 2.9.11 Annually review seed inventories to ensure adequate seed from locally collected native tree species is available for planned reforestation activities on SJNF and TRFO lands.

#### Insects and Disease

#### **Desired Conditions**

2.10.4 Mortality of aspen trees in high value aspen forests due to sudden aspen decline is significantly reduced.

#### Fire and Fuels Management

#### **Desired Conditions**

- 2.11.7 Planned and unplanned fire ignitions are used to increase resiliency and diversity across all forest and rangeland vegetation types.
- 2.11.8 Fire is reintroduce to increase the resistance and resiliency of the warm dry mixed conifer and ponderosa pine forest types in landscape such as Hermosa and Piedra areas.
- 2.11.9 The occurrence of low-elevation fires burning upward into spruce-fir forest increases over time to promote the heterogeneity of spruce-fir forests.

#### Air Quality

#### **Desired Conditions**

2.12.6 Management activities on the SJNF and TRFO control dust in order to minimize impacts of dust-on-snow events.

#### **Standards**

- 2.12.15 Green completion technology for oil and natural gas well completions and for restimulation or refracture activities during workovers is required to prevent venting and most flaring of methane gas and other air pollutants into the atmosphere. Green completion practices include, but are not limited to 1) maximal capturing of fluids, well effluent, and flammable gases as soon as practicable during flowback and cleanout operations; 2) separation of sand, hydrocarbon and other liquids, and gas from saleable products of saleable quantity; 3) storage and delivery of saleable products to sales line; and 4) environmentally safe disposal of non-saleable waste products. Venting of flammable gas during the well completion process would not be allowed except for gas testing or safety and emergency situations. This standard is required for all non-wildcat oil and natural gas wells and would be implemented in all places where technically feasible. (Technically feasible would be determined by the USFS and BLM, with input from air quality regulatory agencies as needed).
- 2.12.16 For exploration, production, transport, and processing of oil and natural gas, storage vessels must not leak and tank thief hatches must be closed when not being serviced during liquid transport, repair, or measuring activities. Valves must be maintained in a leak-free condition (<10,000 ppm leakage). The venting of volatile organic compound and hazardous air pollutants emissions would achieve at least 95 % emission reduction from uncontrolled emissions through the use of vapor recovery units, combustion, or other practices allowed by air quality regulatory agencies.
- 2.12.18 No-bleed, low-bleed, or air-driven pneumatic devices are required for all new and retrofitted oil and natural gas production sites to reduce methane emissions. Exceptions may be made for safety and operational requirements.

#### Guidelines

- 2.12.22 Volatile organic compounds, hazardous air pollutants, and greenhouse gases should not be vented from existing wells and should achieve at least 95% emission reduction from uncontrolled emissions through capture and delivery to sales pipeline, vapor recovery units, combustion, or other practices allowed by air quality regulatory agencies. This would eliminate most venting from well blow-downs, during the well completion process, from oil wells freely venting casing gas, and from defective gas well bores. Exceptions may be allowed for Bradenhead testing or other well tests where venting occurs for time periods of less than 10 minutes.
- 2.12.23 For new lease or new development areas, new mineral development facilities should be collocated and/or centralized. Facilities include roads, well pads, utilities, pipelines, compressors, power sources, fluid storage tanks, and other associated equipment. Collocation of wells (more than one well per pad) should be required where feasible.

#### Alternative Energy

#### **Desired Conditions**

#### **Biomass**

- 2.20.6 Forest vegetation management includes evaluation opportunities for harvesting and removal of biomass to meet treatment objectives.
- 2.20.7 Potential partners are involved and collaborate with in exploring economically efficient means for biomass utilization.

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## Appendix H Oil and Gas Leasing Stipulations

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#### INTRODUCTION

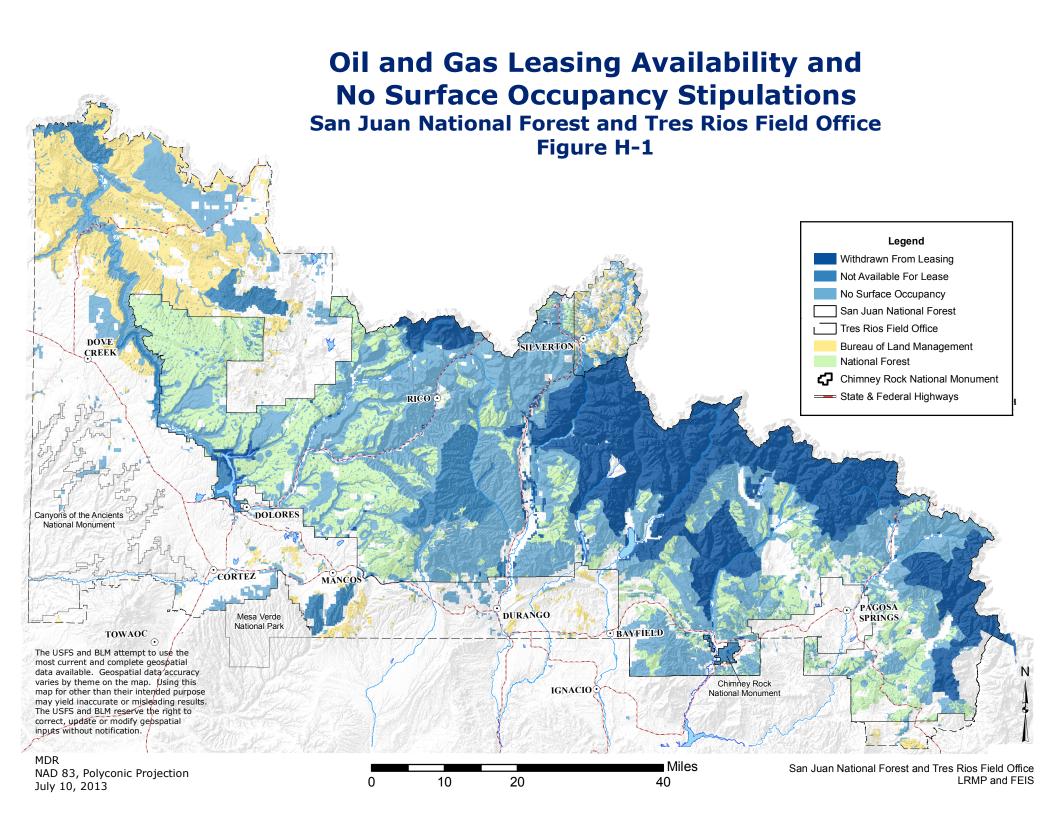
Oil and gas leases issued pursuant to implementation of the San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO) Land and Resource Management Plan (LRMP), and the associated oil and gas leasing analysis decisions, grant the lessee the right to extract the oil and gas resource on Bureau of Land Management (BLM) and federal minerals within the administrative boundary of the SJNF. The BLM is the agency that issues leases for both BLM and National Forest System (NFS) lands. Section 6 of the BLM standard lease form contains terms that require the lessee to conduct operations in a manner that minimizes adverse environmental impacts and to take reasonable measures deemed necessary by the BLM (and U.S. Forest Service [USFS] when NFS lands are leased) to accomplish this intent. Oil and gas leases also include a Notice for Lands of the NFS under Jurisdiction of the U.S. Department of Agriculture, which specifies protection measures for cultural and paleontological resources, and endangered or threatened species. In addition to the standard lease terms, there are additional stipulations that may be utilized and an implementation step that applies to the leasing and permitting process to assure this accomplishment: special lease stipulations and Conditions of Approval. Special lease stipulations are applied at the lease issuance stage and are presented in this appendix to the LRMP. Conditions of Approval are imposed during the oil and gas permitting process, are based on the requirements of the LRMP (the stipulation itself and LRMP standards and guidelines and additional referenced direction), are consistent with lease rights previously granted, and are not included in this LRMP.

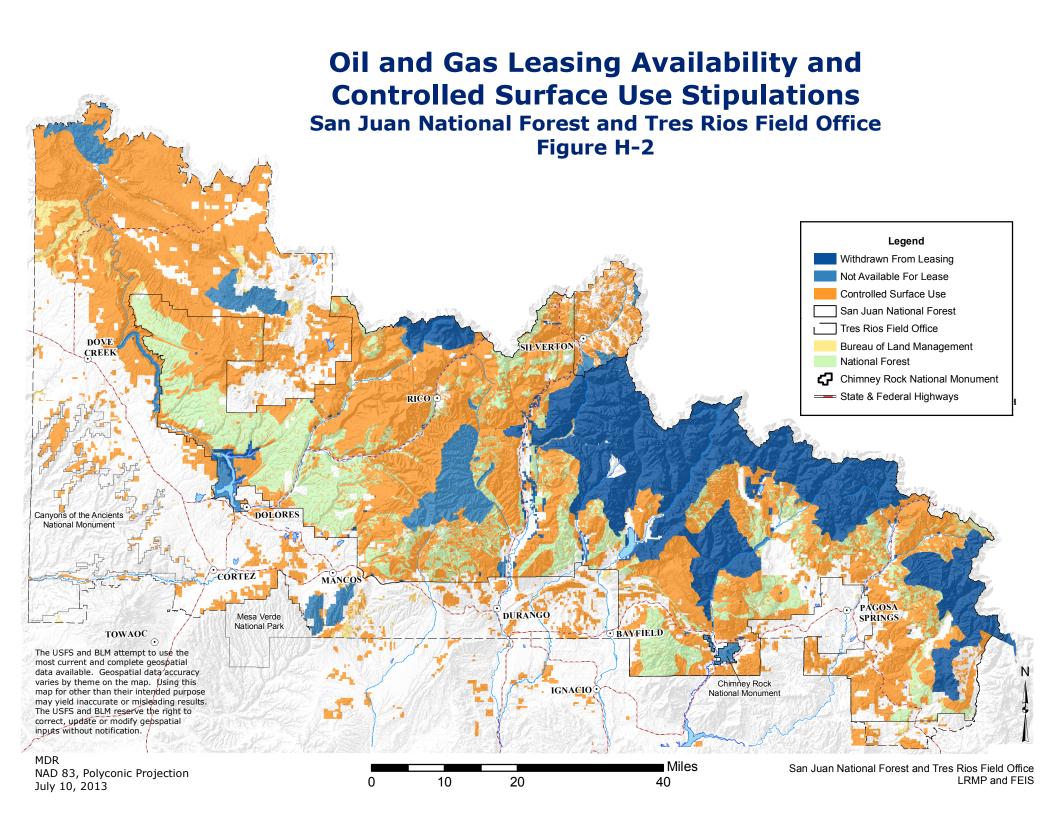
Maps depicting stipulations applied to the SJNF and TRFO lands accompany these leasing stipulations (Figures H.1–H.3). Together, the written stipulations and the mapped geographic information system (GIS) layers describe the lands where stipulations apply. These boundaries can change based on the most current information at the time of the Proposed Action. More than one stipulation can apply to a particular land area; for example, an area may have a controlled surface use stipulation applied for one particular purpose, while also having a timing limitation (TL) applied to address another resource purpose. The stipulation resource databases provide basic resource information by which these multiple determinations can be made and site-specific evaluations would verify the need for these applications. The resource database utilizes resource layers from SJNF and TRFO inventories, as well as other agencies where applicable. Some resources are not mapped or are only partially mapped, including: intermittent and ephemeral streams; jurisdictional dams; groundwater resources; lands with biological soil crusts; sensitive plants; lynx denning sites; nesting and roost sites for eagles, accipiters, falcons, buteos and owls; bats; and portions of the Old Spanish Trail. Resources not mapped or partially mapped will be applied on case by case basis where applicable.

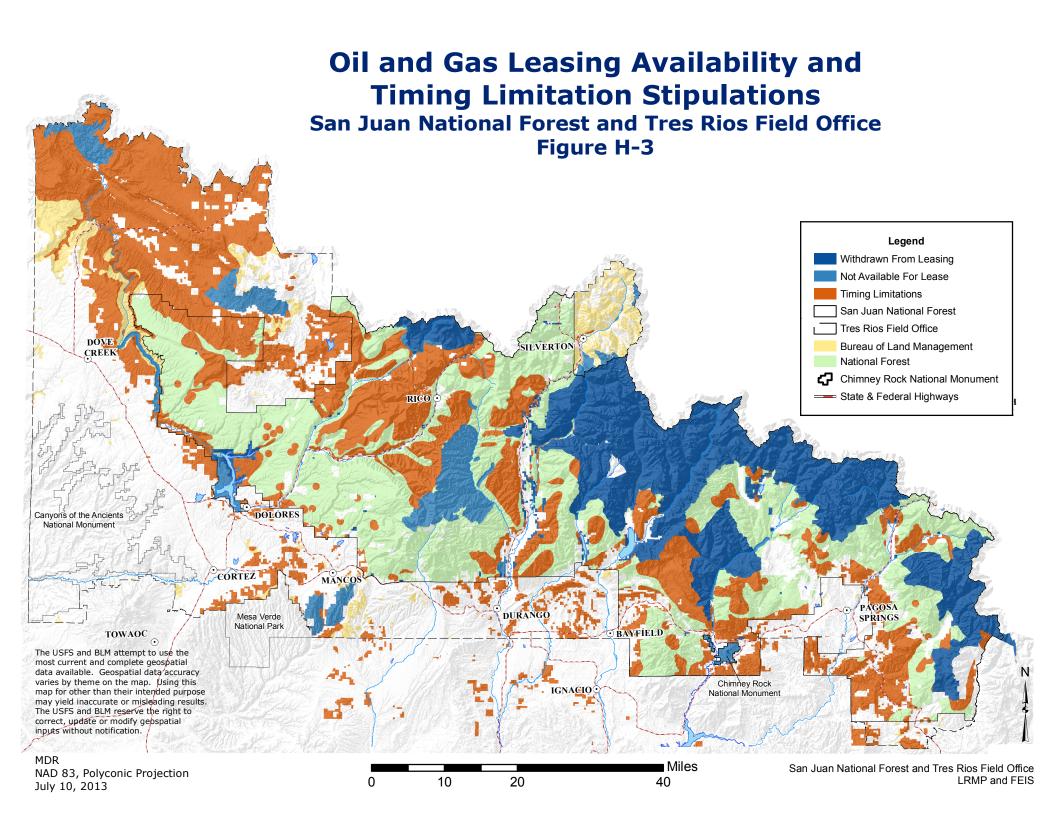
#### Standard Lease Terms

All oil and gas leases are subject to standard lease terms. These are the least restrictive terms under which an oil and gas lessee may operate and meet Energy Policy Act direction to encourage development of federal energy resources. They require operators of oil and gas leases to minimize adverse impacts to air, water, land, visual, cultural, and biological resources and to other land uses and users, and to comply with all applicable laws, regulations and formal orders of the agency managing the leased lands. Leases with standard lease terms allow year-round occupancy and use of leased lands.

Standard lease terms provide that additional, reasonable measures may be required by the Authorized Officer to minimize adverse impacts to other resource values, land uses, or users not addressed in the lease stipulations at the time operations are proposed. To the extent consistent with lease rights granted, reasonable measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. At a minimum, measures shall be deemed consistent with lease rights granted provided that they do not require relocation of proposed operations by more than 200 meters, require that operations be sited off the leasehold, or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year. (43 Code of Federal Regulations [CFR] 3101.1-2)







# **Special Lease Stipulations**

Special lease stipulations are applied to an oil and gas lease if additional restrictions on the operations of lessees are required to protect environmental resources. Stipulations that apply to the SJNF and TRFO new oil and gas leases are described in this appendix. Areas included within the various stipulations are shown on Figures H.1 through H.3. Guidelines for application of special lease stipulations for BLM and NFS lands are contained in the Uniform Format for Oil and Gas Leasing Stipulations (Rocky Mountain Regional Coordinating Committee 1989). Stipulation descriptions by aliquot part would be provided at the time of lease issuance.

It is important to note that the special lease stipulations in this appendix apply only to new leases (issued after adoption of the SJNF and TRFO LRMP). Existing leases are subject to the stipulations attached to them under the current Resource Management Plan (BLM 1985) at the time they were issued. However, new development on existing leases must also comply with the current LRMP management direction. This direction is consistent with the Interior Board of Land Appeals (IBLA) decisions (Yates Petroleum Corp., IBLA 2006-213, 2006-226 and William P. Maycock, IBLA 2008-197, 2008-200) which gives the BLM discretion to modify surface operations to add specific mitigation measures supported by site-specific National Environmental Policy Act (NEPA) analysis undertaken during the development phase on existing leases (CO-2010-028). Any additional mitigation measures would be needed to be justifiable, still provide reasonable access for the leaseholder and would be incorporated in a site-specific document (not as part of this leasing availability decision).

## No Surface Occupancy

Use or occupancy of the land surface for fluid mineral (oil and gas) exploration or development is prohibited to protect identified resource values. However, oil and gas under lands affected by a No Surface Occupancy (NSO) stipulation are legally available for extraction if extraction can be accomplished without occupying the surface (such as through directional drilling or otherwise accessing the reservoir from adjacent lands).

The NSO stipulation is intended for application only where the SJNF and TRFO determines that the standard lease terms are insufficient to provide the level of resource protection necessary to protect resources of concern. An NSO stipulation is not needed if the desired level of protection can be accomplished by relocating a proposed facility or activity within the lease area or by avoiding that activity for a specified period.

#### Controlled Surface Use

Use or occupancy of the land surface for fluid mineral (oil and gas) exploration or development is allowed but identified resource values require special operational constraints that may modify lease rights. A Controlled Surface Use (CSU) stipulation allows the SJNF and TRFO to require that a proposed facility or activity be relocated from the proposed location if necessary to achieve the desired level of protection. CSU provides operating guidance but does not substitute for NSO or TL stipulations. CSU allows year-round occupancy and accessibility to leased lands while providing mitigation of effects on other resources.

# Timing Limitation

Use or occupancy of the land surface for oil and gas exploration or development is prohibited during a specified period of the year. The scope of the TL stipulation goes beyond ground-disturbing activities to encompass any source of protracted or high-intensity disturbance that could interfere with normal wildlife behavior and adversely affect habitat use. The TL stipulation does not apply to the operation and maintenance of production facilities unless the analysis demonstrates the continued need for such mitigation and that less stringent project-specific mitigation measures (such as Conditions of Approval) would not be sufficient. The TL allows the SJNF and/or TRFO to restrict exploration operations on leased lands for more than 60 days. The TL stipulation provides for partial accessibility for a portion of the year

and maintains the potential for extraction of oil and gas, but may increase costs due to timing constraints (such as a short operating season).

## Exception, Modification, and Waiver of Stipulations

Federal regulations allow for the granting of exceptions, modifications, and waivers to stipulations on oil and gas leases, as laid out in Chapter IV, Section C.3, of BLM Handbook H-1624-1 Planning for Fluid Mineral Resources. That handbook provides the following definitions:

- Exception A one-time exemption from a stipulation that is determined on a case-by-case basis;
- Modification A change to the provisions of a stipulation, either temporarily or for the term of the lease; and
- Waiver A permanent exemption to a stipulation.

Thus, an exception suspends the restrictions of a stipulation for a specified period of time, activity, or portion of the area where applied but remains in effect relative to the remainder of the lease. A modification consists of a temporary or permanent change to a stipulation, such as a change in the areas, activities, or periods of time where applied, but does not wholly eliminate the stipulation. A waiver permanently eliminates the restrictions of a stipulation, including all areas, activities, or periods of time to which applied. While some lease stipulations detail the conditions upon which waivers, exceptions, and modifications can be granted, a lessee may submit requests for exceptions, modifications, or waivers to the line officer for consideration for all stipulations in this appendix.

Section C.3 of Chapter IV of BLM Handbook H-1624-1 states that "circumstances for granting a waiver, exception, or modification must be documented in the plan or plan amendment" and that the "plan or plan amendment should also identify the documentation requirements for supporting a waiver, exception, or modification and any public notification associated with granting them." Additionally, the regulatory requirements for granting waivers and modifications found at 43 CFR 3101.1 state that

a stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts. If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver. If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day period.

Based on BLM Handbook H-1624-1 and 43 CFR 3101.1, the LRMP includes the following requirements for granting an exception, modification, or waiver to an oil and gas lease stipulation:

- Granting an exception, modification, or waiver to a lease stipulation shall be limited to situations
  in which the Authorized Officer determines that 1) the factors that led to its inclusion in the lease
  have changed sufficiently to make it no longer justified, or 2) granting of the exception,
  modification, or waiver as sought would not cause unacceptable impacts to the resource
  protected by the stipulation.
- Documentation requirements for granting an exception, modification, or waiver to a lease stipulation shall consist of written documentation by the BLM Authorized Officer, including, as appropriate, supporting documentation by a BLM resource specialist, representative of another resource management agency (e.g., U.S. Fish and Wildlife Service [USFWS], USFS, or Colorado Parks and Wildlife [CPW]), or technical consultant, upon which the Authorized Officer relied in making his or her determination.

The following waiver, exception, modification criteria would apply to all stipulations identified in this appendix.

**Exception:** The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the LRMP, or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

**Modification:** The Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the LRMP, 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the LRMP, or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

**Waiver:** The Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

On BLM federal mineral estate leases, exceptions, modifications, and waivers would be considered for all leasing stipulations in this appendix. Detailed exceptions, modifications and waivers identified under each of the stipulations apply only to leases USFS mineral estate lands.

#### **Lease Notice**

In addition to standard lease terms and special lease stipulations, the SJNF and TRFO may attach a Lease Notice to the lease. The Lease Notice provides information concerning limitations that already exist in law, lease terms, regulation or operational orders. A Lease Notice also addresses special items the lessee should consider when planning operations, but does not impose new or additional restrictions beyond those already in the standard lease term or special lease stipulations.

# **Split Estate**

In split estate situations, the surface rights and subsurface rights (such as the rights to develop minerals) for a piece of land are owned by different parties. In these situations, mineral rights are considered the dominant estate, meaning they take precedence over other rights associated with the property, including those associated with owning the surface. However, the mineral owner must show due regard for the interests of the surface estate owner and occupy only those portions of the surface that are reasonably necessary to develop the mineral estate. The USFS and BLM cannot apply lease stipulations to a private mineral action.

#### **Not Available for Lease**

The following resources and areas are not available for lease on SJNF and TRFO lands: lands recommended for wilderness designation, wilderness study areas; wild segments of suitable Wild and Scenic Rivers (WSR), Chimney Rock National Monument, and the Anasazi and Falls Creek National Registered District.

# 1. WATER AND SOIL RELATED STIPULATIONS AND NOTICES

# 1.1 Municipal Watersheds and Public Water Supply

#### 1.1.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Lands within 1,000 horizontal feet of either side of a classified surface water supply stream segment (as measured from the average high water mark of a water body) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado used as a public (municipal) water supply. For all domestic water supplies using a groundwater well or spring, no surface occupancy would be allowed within a minimum distance of 1,000 horizontal feet.

**For the purpose of:** Protecting public water supplies, water quality, aquatic habitat and human health. A watershed that serves a "public water system." As defined by the State of Colorado, a "public water system" is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

**Justification**: NSO on lands with the highest migration potential and the closest proximity to a public water supply intake would provide protection for human health and protect water quality for water supply use classification standards.

Potential contaminant migration may vary by geologic strata, depth, transmissivity, and percolation of groundwater. Shorter migration paths and times of travel mean less chance for dilution or degradation of the contaminant before it reaches the intake. The proximity of the potential contaminant source to the surface water drainage network and its proximity to the intake approximate the relative migration path and time that a contaminant must travel to enter the source water and then flow to the intake.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if an alternative design, monitoring, and emergency response plan is equally or more protective than the stipulation requirements, as determined by an agency hydrologist/hydrogeologist/water engineer and the line officer.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

#### 1.1.2 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: Oil and gas operations located greater than 1,000 horizontal feet but less than 2,300 horizontal feet of a classified surface water supply stream segment (as measured from the average high water mark of a water body) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado would require the following protective measures. The buffer may be extended beyond 2,300 horizontal feet if site-specific conditions warrant it. This also applies to domestic wells and springs:

- Pitless drilling systems.
- Flowback and stimulation fluids contained within tanks that are placed on a well pad or in an area with lined and down-gradient berming.
- Use non-toxic hydraulic fracturing fluids only.
- Berms or other containment devices shall be constructed in compliance with Rule 603.e. (12) around crude oil condensate and produced water storage tanks.
- Notification of potentially impacted public water systems 15 miles downstream.
- The use of evaporation ponds for means of disposing of produced water shall not be permitted on BLM-administered lands within the municipal watershed.
- Collection of baseline water quality data (surface and/or groundwater) consisting of a pre drilling sample collected within a 100 feet of well pad, or where sufficient water exists to collect a sample per U.S. Environmental Protection Agency or U.S. Geological Survey collection methods. Additional sampling must be conducted during drilling operations and immediately following well completion. Each sample should analyze at a minimum:
  - pH, alkalinity, specific conductance, major cations, major anions, total dissolved solids, benzene, toluene, ethylbenzene, xylene (BTEX)/gasoline range organics (GRO)/diesel range organics (DRO)/total petroleum hydrocarbons (TPH)/polycyclic aromatic hydrocarbons (PAH)(including benzene [a] pyrene and metals [arsenic, barium, calcium, iron, magnesium, manganese, lead, and selenium]). For municipal watersheds, a coordinated water resources monitoring plan must be developed with the BLM and municipality. Each office would determine the sampling site, intensity, and need for groundwater sampling, depending on site-specific geology and risk. Results must be submitted to the BLM within 3 months of data collection per Section 317b of the Colorado Oil and Gas Conservation Commission regulations.
- Operators shall develop, maintain, and immediately implement an emergency spill response
  program that includes employee training and maintenance at all times of current direct contact
  information for any downstream public water supplier(s), as well as the ability to notify any such
  downstream public water supplier(s).
- Any other protection measures deemed necessary to protect the municipal water supply

For the purpose of: Protecting public water supplies and water quality.

**Justification:** CSU on lands with high migration potential and proximity to a public water supply intake would provide protection for human health and protect water quality for Water Supply Use Classification standards.

Potential contaminant migration may vary by geologic strata, depth, transmissivity, and percolation of groundwater. Shorter migration paths and times of travel mean less chance for dilution or degradation of the contaminant before it reaches the intake. The proximity of the potential contaminant source to the surface water drainage network and its proximity to the intake approximate the relative migration path and time that a contaminant must travel to enter the source water and then flow to the intake.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the resource or resource use that the stipulation was designated to protect.

**Modifications:** Modification may apply if an alternative design, monitoring, and emergency response plan is equally or more protective than the stipulation requirements, as determined by an agency hydrologist/hydrogeologist/water engineer and the line officer.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.2 Major River Corridors

#### 1.2.1 No Surface Occupancy

**No surface occupancy or use is allowed in the lands described below:** Prohibit surface occupancy and surface-disturbing activities within stream channels, stream banks, and the area 2,500 horizontal feet on either side of the ordinary high water mark (bank-full stage).

**For the purpose of:** To protect rivers and adjacent aquatic habitat that provide: 1) special status or critical fish and wildlife species habitat, 2) important riparian values, 3) water quality/filtering values, 4) waterfowl and shorebird production values, 5) valuable amphibian habitat, 6) 100-year floodplain, and 7) high scenic and recreation values of major rivers.

**Justification**: Minimizing potential deterioration of water quality, high scenic and recreation values, maintain natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities, and preserve wildlife habitat including designated critical habitat for federally listed fish species. The buffers are sized to accommodate the rivers' larger floodplains and wider riparian zones.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if a professionally engineered design is implemented and a construction, maintenance, and reclamation plan can mitigate to the fullest extent all potential resource damage associated with the Proposed Action.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 1.3 Perennial Streams, Water Bodies, Riparian Areas, and Fens

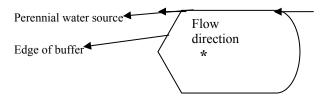
## 1.3.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Prohibit surface occupancy and surface-disturbing activities within a minimum buffer distance of 325 horizontal feet for all perennial waters. For perennial streams, the buffer would be measured from the ordinary high water mark (bankfull stage), whereas for wetland features, the buffer would be measured from the edge of the mapped extent (Table H.1). For unmapped wetlands, the vegetative boundary (from which the buffer originates) would be determined in the field. Where the riparian zone extends beyond 325 feet, the NSO stipulation would be extended to include the entire riparian zone.

Table H.1: No Surface Occupancy Buffers for Perennial Waters

Water Body Type	Buffer Width (feet)
Fens and wetlands	325*
Perennial streams (with or without fish)	325 (as measured from ordinary high water mark)
Lotic or lentic springs and seeps	325 (as measured from wetland vegetation edge)
Riparian	325 (or greater if riparian area is wider than 325 feet)

<sup>\*</sup>See Modification.



Wetland buffer dimensions may be averaged to accommodate variability in terrain or development plans. Up-gradient distances should be maintained (i.e., up- gradient buffer distances of 325 feet), while downgradient buffers may be reduced to no less than 100 feet. The buffer averaging must, however, not adversely affect wetland functions and values, and a minimum buffer distance of 100 feet from the wetland edge is maintained. The buffer's intent is to protect the water source area of the wetland, which is more important than the down-gradient portion of the wetland.

**For the purpose of:** Maintaining the proper functioning condition, including the vegetative, hydrologic and geomorphic functionality of the perennial water body. Protect water quality, fish habitat, aquatic habitat, and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

*Justification*: Wetlands, floodplains, riparian areas, water influence zones, and fens represent important ecological components and functions, such as storing water, stabilizing valley floors, enhancing water quality, and providing recreation and aesthetic values, biological diversity, and wildlife species with habitat, water, food, cover, and travel routes. They are easily disturbed by ground-disturbing activities that can cause soil erosion, soil compaction, and adverse changes to the hydrologic function that is important to maintaining the hydrologic and ecological integrity of these lands.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be allowed if the agency determines that project design or mitigation measures can be used to prevent impacts to reservoirs. Consideration must include the degree of slope, soils, importance of the amount and type of wildlife and fish use, water quality, riparian vegetation, and other related resource values. If wetlands are present around the reservoir, no exceptions would be granted unless compliance can be demonstrated with Executive Order 11990. In addition, an exception may be granted for stream crossings where no other alternative exists, such as another route, and must be approved by the Authorized Officer.

**Modifications:** Wetland buffer dimensions may be averaged to accommodate variability in terrain or development plans. Up-gradient distances should be maintained (i.e., up-gradient buffer distances of 325 feet), while down-gradient buffers may be reduced to no less than 100 feet. The buffer averaging must, however, not adversely affect wetland functions and values, and a minimum buffer distance of 100 feet from the wetland edge is maintained. The buffer's intent is to protect the water source area of the wetland, which is more important than the down-gradient portion of the wetland.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

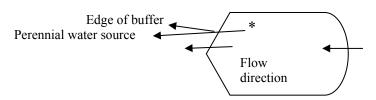
Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 1.3.2 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: From 325 to 500 horizontal feet from the perennial water body, CSU restrictions would apply. Surface-disturbing activities may require special engineering design, construction and implementation measures, including re-location of operations beyond 656 feet (200 meters) to protect water resources within the 325 foot NSO buffer. For perennial streams, the buffer would be measured from ordinary high water mark (bankfull stage), whereas for wetland features, the buffer would be measured from the edge of the mapped extent (Table H.2). For unmapped wetlands, the vegetative boundary (from which the buffer originates) would be determined in the field.

Table H.2: Controlled Surface Use buffers for perennial waters.

Water Body Type	Buffer Width (feet)
Fens and wetlands	325–500*
Perennial streams (with or without fish)	325–500 (as measured from ordinary high water mark)
Lotic or lentic springs and seeps	325–500 (as measured from wetland vegetation edge)



**For the purpose of:** Maintaining the proper functioning condition, including the vegetative, hydrologic, and geomorphic functionality of the perennial water body, to protect water quality, fish habitat, and aquatic habitat and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

**Justification:** Minimizing potential deterioration of water quality; maintaining natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities; and preserving wildlife habitat. The buffers are sized to accommodate the rivers' larger floodplains and wider riparian zones.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if a professionally engineered design is implemented and a construction, maintenance, and reclamation plan can mitigate to the fullest extent all potential resource damage associated with the Proposed Action.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

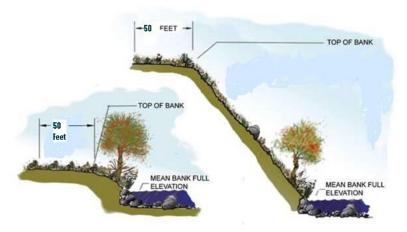
**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.4 Intermittent and Ephemeral Streams

## 1.4.1 No Surface Occupancy

**No surface occupancy or use is allowed in the lands described below:** NSO of 50 horizontal feet as measured from the top of the stream bank for all intermittent or ephemeral streams (see diagram). If riparian vegetation extends beyond the top of the stream bank, the buffer would be measured from the extent of the riparian vegetation.



**For the purpose of:** Maintaining and protecting water quality, stream stability, aquatic health, seasonal use and downstream fisheries, and sediment processes downstream.

**Justification:** Minimizing potential deterioration of water quality and maintaining natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if a professionally engineered design is implemented and a construction, maintenance, and reclamation plan can mitigate to the fullest extent all potential resource damage associated with the Proposed Action.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

#### 1.4.2 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: CSU from the edge of the NSO buffer to 100 horizontal feet. Avoid locating roads, stream crossings, and facilities within this zone, because activities within this area can potentially affect streams and water quality. Adequate professional design and engineering of activities in this zone is necessary to prevent stormwater runoff and sedimentation. Measurement is from the top of the stream bank, although if wetland vegetation exists, then the measurement is from the vegetation's edge.

**For the purpose of:** Minimizing the risk of sedimentation, spills, and other contaminants reaching intermittent and/or ephemeral streams to protect water quality, stream function, and aquatic habitat.

**Justification:** CSU in this zone would minimize potential deterioration of water quality, maintain natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would cause only negligible impacts to the resource or resource use that the stipulation was designated to protect or would improve the protected resource or resource use as defined by LRMP objectives, standards, or conditions.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 1.5 Jurisdictional Dams

#### 1.5.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Prohibit surface occupancy and subsurface-disturbing activities within 3,000 feet horizontally and infinite depth vertically of jurisdictional dams (as defined by the Colorado Division of Water Resources) used to impound water.

For the purpose of: To protect the structural integrity of dams and/or public safety.

**Justification:** Avoid structural damage to dams and subsequent risk to public safety and dam infrastructure due to disturbance associated primarily with drilling and completion/re-completion activities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the oil and gas activity can be mitigated to the extent that no impacts to the resource that the stipulation was designated to protect or would provide or would provide increased protection to the resource as defined by LRMP objectives, standards, or conditions.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 1.6 Groundwater Resources

#### 1.6.1 Controlled Surface Use (Groundwater resources shallow)

**Surface occupancy or use is subject to the following special operating constraints:** Oil and gas surface operations over shallow (<2,000 feet) potentially usable groundwater (<10,000 total dissolved solids) shall use the following protection measures:

- Pitless, self-contained drilling systems.
- In the completion of an oil, gas, injection, disposal, or service well, where acidizing or fracture processes are used, no deleterious substances shall be permitted to pollute subsurface water.
- Flowback and stimulation fluids would be contained within tanks that are placed on a well pad or in a lined, bermed area.
- Fluids, additives, and other materials used for drilling and completion operations must be protective of public health and the environment in the areas where they are used.
- For well where a multi-stage high volume hydraulic fracturing is anticipated, the operators shall indicate the method used to handle, transport, and dispose of the recovered fluids.

**For the purpose of:** Minimizing the risk of spills and other contaminants reaching potentially usable groundwater with a water table up to 2,000 feet that is near the surface.

**Justification:** CSU would minimize the risk of water quality contamination and maintain the integrity of potentially usable groundwater resources for present and future uses.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the oil and gas activity can be mitigated to the extent that only negligible impacts to the resource or resource use that the stipulation was designated to protect or would improve the protected resource or resource use as defined by LRMP objectives, standards, or conditions.

**Modifications:** A modification may be granted by the Authorized Officer if it can be demonstrated that the oil and gas activity can be mitigated to the extent that only negligible impacts to the resource or resource use that the stipulation was designated to protect or would improve the protected resource or resource use as defined by LRMP objectives, standards, or conditions.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

#### 1.6.2 Controlled Surface Use

**Surface occupancy or use is subject to the following special operating constraints:** Oil and gas operations using multi-stage hydraulic fracturing shall use the following measures to protect potentially usable water bearing intervals:

- The placement of all stimulation fluids shall be confined to the objective formation to the extent practicable.
- In all directions a minimum of 2,500 feet of buffer distance (or greater if deemed necessary by BLM) between the well bore (production string) and the lower extent of shallow (<2,000 feet), potentially usable groundwater (<10,000 total dissolved solids) aquifer, shall be maintained so that fractures from the hydraulic fracturing process do not intersect shallow aquifers.
- A continuous column of cement shall extend from the surface casing shoe back to ground level.
   If cement is not circulated to surface, then a remedial cement job shall be performed to ensure complete cement coverage.
- A cement bond log shall be required in the surface string.
- Surface casing set depth shall be at least 50 feet below any potentially usable water bearing interval.
- Pitless, self-contained drilling systems.
- In the completion of an oil, gas, injection, disposal, or service well, where acidizing or fracture processes are used, no deleterious substances shall be permitted to pollute subsurface water.
- Fluids, additives, and other materials used for drilling and completion operations must be protective of public health and the environment in the areas where they are used.
- Operators shall indicate the method used to handle, transport, and dispose of the recovered fluids.
- Upon request of the BLM, operators shall provide reports that disclose the complete chemical makeup of all materials used in the proposed and actual drilling and stimulation fluids without regard to original source additive.

For the purpose of: Protecting potentially usable groundwater.

**Justification:** CSU would minimize the risk of groundwater contamination and maintain the integrity of potentially usable water bearing intervals for present and future uses.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the oil and gas activity can be mitigated to the extent that only negligible impacts to the resource or resource use that the stipulation was designated to protect.

**Modifications:** A modification may be granted by the Authorized Officer if it can be demonstrated that the oil and gas activity can be mitigated to the extent that only negligible impacts to the resource or resource use that the stipulation was designated to protect or would improve the protected resource or resource use as defined by LRMP objectives, standards, or conditions.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 1.7 Reservoirs and Lakes

#### 1.7.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** For reservoirs and lakes one acre or larger as measured by the high water mark, NSO is stipulated within 0.25 mile of the high water shoreline.

For the purpose of: Protecting water quality and the scenic, recreation, wetland, and wildlife values associated with the lake or reservoir and its shoreline.

Justification: Oil and gas development is incompatible with the emphasized use of these areas.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be allowed if the agency determines that project design or mitigation measures can be used to prevent impacts to reservoirs. Consideration must include the degree of slope, soils, importance of the amount and type of wildlife and fish use, water quality, riparian vegetation, and other related resource values. If wetlands are present around the reservoir, no exceptions would be granted unless compliance can be demonstrated with Executive Order 11990.

**Modifications:** A modification may be allowed if the agency determines that project design or mitigation measures can be used to prevent impacts to reservoirs. Consideration must include the degree of slope, soils, importance of the amount and type of wildlife and fish use, water quality, riparian vegetation, and other related resource values. If wetlands are present around the reservoir, no exceptions would be granted unless compliance can be demonstrated with Executive Order 11990.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.8 Technologically Enhanced Naturally Occurring Radioactive Materials

#### 1.8.1 Lease Notice

Oil and gas operations targeting shale formations have the potential to bring to the surface, and concentrate, naturally occurring radioactive materials. These operations can lead to the spread of radioactive contamination and potential human health risks. Wells targeting shale gas plays are subject to the following special sampling requirements:

- All exploratory wells targeting shale gas formations shall obtain a representative sample of
  cuttings from the targeted formation and complete analysis in accordance with General Provision
  3.1.6 of the Colorado Department of Public Health and the Environment (CDPHE) Interim Policy
  and Guidance Pending Rulemaking for Control and Disposition if Technologically-Enhanced
  Naturally Occurring Radioactive Materials in Colorado, or the equivalent provisions of any future
  rulemaking decision. The results shall be provided to the SJNF and TRFO.
- During the first multi-stage hydraulic fracturing of a well targeting shale gas in any given section, representative samples of cuttings, flowback fluids, produced waters, and sludge shall be analyzed in accordance with General Provision 3.1.6 of the CDPHE Interim Policy and Guidance Pending Rulemaking for Control and Disposition if Technologically-Enhanced Naturally Occurring

Radioactive Materials in Colorado, or the equivalent provisions of any future rulemaking decision. The results shall be provided to the SJNF and TRFO.

# 1.9 Lands with Slopes Greater Than 35 Percent

## 1.9.1 No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** Lands with slopes greater than 35 percent.

**For the purpose of:** Preventing mass movement and the associated loss of soil productivity, preventing damage to structures and equipment, and protecting riparian areas, wetlands, and aquatic ecosystems from sedimentation and for safety reasons.

**Justification:** Slopes greater than 35 percent have high to very high potential for mass movement and excessive sheet erosion especially when they are impacted by ground-disturbing management activities. These lands are also very difficult to reclaim following disturbance.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions to this stipulation may be authorized if the operator submits an engineering plan approved by the USFS demonstrating that ground-disturbing activities would not result in mass movement, loss of soil productivity, or excessive sheet erosion and that a reclamation plan has been developed.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.10 Lands with 25 to 35 Percent Slopes and Lands with Shale Soils

#### 1.10.1 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: Management activities proposed on those lands would require the lessee to submit an operating plan to an authorized official, which may include special design, construction, and implementation measures (including the relocation of operations by more than 650 feet) that describes how soil erosion, soil compaction, and runoff would be prevented or minimized, and how disturbed sites would be reclaimed.

**For the purpose of:** Preventing soil erosion, soil compaction, and runoff and the associated loss of soil productivity, and protecting riparian areas, wetlands, and aquatic ecosystems from sedimentation.

**Justification:** Lands with slopes of 25% to 35% and lands with shale soils have moderate to high potential for soil erosion, soil compaction, and runoff particularly when they are impacted by ground-disturbing management activities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorize Officer may grant an exception to this stipulation if the operator submits an engineering plan demonstrating that ground-disturbing activities would not result in mass movement or excessive sheet erosion and that a reclamation plan has been developed.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 1.11 Lands Prone to Mass Movement

# 1.11.1 No Surface Occupancy

No surface occupancy is allowed on the lands described below: Lands prone to mass movement and lands within a 100-foot buffer around those lands. Lands prone to mass movement include canyon escarpments, hill/mountain dipslopes, lands with unstable geologic formations (including the Morrison, Mancos Shale, Lewis Shale, and Fruitland Formations on the SJNF and TRFO), lands that display evidence of past mass movement (including landslides, landflows, and landslumps), lands lacking vegetation (badlands and burned areas), lands with slopes greater than 35%, and lands associated with map units that have high or very high potential for mass movement (including soil survey map units 254, 386, 606, 720, 926, 20511D, 30506D, 34301D, 34306D, 34506D, 50803D, 50806D, 70806D, 70807D, 74803D, 80604D, 80803D, and 80804D).

**For the purpose of:** Preventing mass movement and the associated loss of soil productivity, as well as damage to structures and equipment, and for safety reasons.

**Justification:** The potential for mass movement and its adverse affects is high to very high for lands prone to mass movement especially when those lands are impacted by ground-disturbing activities. Mass movement could cause ruptured pipelines, water/oil/condensate spills, gas explosions, and damaged storage tanks, and could cause injury to people. Those lands are also very difficult to reclaim.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception to this stipulation if the operator submits an engineering plan demonstrating that ground-disturbing activities would not result in mass movement and that a reclamation plan has been developed.

**Modifications:** The Authorized Officer may grant a modification to this stipulation if site-specific field analysis indicates that the soil survey map units that have high or very high potential for mass movement are not mapped properly.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 1.12 Lands with Gypsum Soils

#### 1.12.1 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: On lands with gypsum soils or gypsum bedrock and on lands within a 100-foot buffer around them. Management activities proposed on those lands would require the lessee to submit an operating plan to an authorized official, which may include special design, construction, and implementation measures (including the relocation of operations by more than 650 feet) that describes how impacts to gypsum soils, as well as the rare plants that occur on them, would be prevented or minimized and how disturbed sites would be reclaimed.

**For the purpose of:** Protecting the unique and rare gypsum soils on SJNF and TRFO lands and protecting the special status plant species associated with those soils.

**Justification:** Ground-disturbing activities could cause adverse effects to gypsum soils and to the rare plants and lichens associated with them including mortality to plants and lichens, soil erosion, and soil compaction.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that impacts to gypsum soils would not occur or be negligible.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers**: No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.13 Lands with Biological Soil Crusts

#### 1.13.1 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: On lands with biological soil crusts exhibiting a Level of Darkness class of 4 or above on the soil surface (see Belnap et al. 2008). Management activities proposed on those lands would require the lessee to submit an operating plan to an authorized BLM or USFS official, which may include special design, construction, and implementation measures (including the relocation of operations by more than 650 feet) that describes how impacts to biological soil crusts would be prevented or minimized, and how disturbed sites would be reclaimed.

For the purpose of: Protecting biological soil crusts and the important ecosystems in which they occur.

**Justification:** Biological soil crusts (also known as microbiotic or cryptogamic crusts) are unique components of biodiversity and important components of the semi-desert shrublands, semi-desert grasslands, sagebrush shrublands, and pinyon-juniper woodlands on the SJNF and TRFO. They play an important role in ecosystem restoration, they are very sensitive to disturbances, and they are very slow to recover from disturbances (Bowker 2007). Ground-disturbing activities could cause direct effects to biological soil crusts including mortality and could cause soil erosion and soil compaction to the associated soils, which could adversely affect the crusts habitat.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that impacts to biological soil crusts would not occur or be negligible.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers**: No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 1.14 Fruitland Formation Outcrop Zone

#### 1.14.1 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: Fluid mineral development from the Fruitland Formation, on or within 1.5 miles basin inward of the Fruitland Formation Outcrop, as measured from the geologic contact of the Fruitland Formation and the Kirtland Shale, may be authorized on valid leases after the BLM and the USFS (if NFS lands are involved) accept an Outcrop Zone Plan from the operator as an additional requirement of the Application for Permit to Drill process. Outcrop Zone Plans are described in Decision Point 5 of the April 2007 Northern San Juan Basin Coal Bed Methane Project Record of Decision (NSJB ROD).

**For the purpose of:** Preventing or minimizing potential methane seepage and water depletion impacts at the Fruitland Formation Outcrop.

**Justification:** The lands described above may be leased for fluid mineral development as long as any associated operations are consistent with the requirements of NSJB ROD Decision Point 5. The analyses forming the basis for the NSJB ROD were subject to extensive input and review, and decisions in the NSJB ROD have been upheld in all circumstances to date.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception to this stipulation if substantial and conclusive evidence that outcrop impacts would not occur or change as a result of a proposed operation is presented to and accepted by the USFS.

**Modification:** Modifications to this stipulation may be made if substantial and conclusive evidence shows that changes should be made to the Outcrop Zone area or approach.

**Waivers:** The Authorized Officer may grant a waiver to this stipulation if substantial and conclusive evidence that outcrop impacts would not occur or change as a result of any operations, current or future, proposed in the Outcrop Zone is presented to and accepted by the USFS.

# 2. VEGETATION AND PLANT RELATED STIPULATIONS AND NOTICES

# 2.1 Threatened or Endangered Plants, Plants Proposed for Federal Listing, or Candidate Plants for Federal Listing

#### 2.1.1 No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** Lands occupied by plant species that are federally listed (threatened or endangered), proposed for federal listing, or candidates for federal listing; lands designated as critical habitat for federally listed species; and lands within a 650 foot (i.e., 200 meter) buffer around all those lands.

**For the purpose of:** To protect rare plant species and their critical habitat from direct and indirect impacts associated with management actions that could adversely affect their viability and could lead to their extinction.

**Justification:** Management actions on the SJNF and TRFO could affect federally listed plant species (threatened or endangered), plant species proposed for federal listing, and plant species that are candidates for federal listing; and could affect the critical habitat for those species, which could adversely affect the viability of those species and could lead to their extinction.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exception:** An exception may be granted if the operator can demonstrate that the specific location of the Proposed Action would not impact threatened and endangered species and their habitat, e.g., where topography, changes in elevation, etc., would physically isolate plants from development.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers**: No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 2.2 Colorado Bureau of Land Management State Director's Sensitive Plants and Region 2 Regional Forester's Sensitive Plants

#### 2.2.1 Controlled Surface Use

Controlled surface use is allowed on the lands described below: Lands occupied by Colorado BLM State Director's Sensitive Plant Species, Region 2 Regional Forester's Sensitive Plant Species, and on lands within a 325-foot buffer around lands occupied by those plant species. Management activities proposed on those lands would require the lessee to submit an operating plan to a BLM Authorized Official, which may include special design, construction, and implementation measures (including the relocation of operations by more than 650 feet) that describes how impacts to BLM State Director's Sensitive Plant Species and Region 2 Regional Forester's Sensitive Plant Species would be prevented or minimized and how disturbed sites would be reclaimed.

**For the purpose of:** Protecting rare plant species and their habitat from direct and indirect impacts associated with management actions that could adversely affect those rare plants.

**Justification:** Management actions on the SJNF and TRFO could affect Colorado BLM State Director's Sensitive Plant Species, Region 2 Regional Forester's Sensitive Plant Species, and their habitat, which could adversely affect the viability of those species and could lead to a trend to federal listing under the Endangered Species Act.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exception:** An exception may be granted if the operator can demonstrate that the specific location of the Proposed Action would not impact the sensitive plant species and their habitat, e.g., where topography, changes in elevation, etc., would physically isolate the plants from development.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers**: No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 2.3 Special Botanical Areas

## 2.3.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below:

- O'Neal Hill
- Chattanooga Fen including a 300-foot buffer from the exterior edge of the Chattanooga Fen

For the purpose of: Protecting the rare plant species and the habitat of those rare species.

**Justification:** The special botanical areas (SBAs) listed above contain rare plant species including Region 2 Sensitive Species. Ground-disturbing activities can cause adverse effects or mortality to the rare plants with the SBAs. They can also cause soil erosion and soil compaction to these lands and the habitat they provide for rare plant species.

Fens are the habitat for the rare plant species in the Chattanooga Fen SBA. Fens represent a very important ecological component of the SJNF. They store water, stabilize valley floors, enhance water quality, provide recreation and esthetic values, provide biological diversity, and provide wildlife species with habitat, water, food, cover, and travel routes. These areas are easily disturbed and can be severely impacted by ground-disturbing activities that can cause soil erosion, soil compaction, and adverse changes to the hydrologic function that is so important to maintaining the hydrologic and ecological integrity of these lands.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted if the operator can demonstrate that the specific location of the Proposed Action would not impact the rare plant species and their habitat, e.g., where topography, changes in elevation, etc., would physically isolate the plants from development.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 2.4 Research Natural Areas

## 2.4.1 No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** The existing Narraguinnep and Williams Creek Research Natural Areas (RNAs) and the proposed RNAs including Electra, Grizzly Peak, Hermosa, Hidden Mesas, Martinez Creek, Navajo River, Piedra, and Porphyry Gulch.

For the purpose of: Protecting the ecological integrity of the existing and proposed RNAs on the SJNF.

**Justification:** RNAs are areas designated to maintain biological diversity on NFS Lands. They represent relatively natural, unaltered ecosystems that serve as reference areas to assess the consequences of management actions on other similar lands. Ground-disturbing activities could adversely affect the ecological values that the RNAs are intended to protect.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions**: No circumstances have been identified under which an exception would be allowed.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers**: No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 2.5 Old Growth Forests and Woodlands

# 2.5.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within ponderosa pine, warm dry mixed conifer, and pinyon-juniper old growth areas as defined in the glossary for the LRMP and FEIS. These old growth areas may be previously documented or may be identified during lease or project-level analyses and field review.

For the purpose of: Minimizing impacts to ponderosa pine, warm dry mixed conifer, and pinyon-juniper old growth areas.

**Justification:** Old growth ponderosa pine and warm-dry mixed conifer forests, and old growth pinyon-juniper woodlands have high ecological values and are relatively uncommon on the SJNF and TRFO due, in part, to past human-caused disturbances. Since old growth forests and woodlands take hundreds of years to develop, they are virtually irreplaceable in terms of human lifetimes.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted if the operator can demonstrate that the specific location of the Proposed Action would not impact the old growth forest, e.g., where topography or changes in elevation, etc., would physically isolate the plants from development.

**Modification:** The Authorized Officer may grant a modification to this stipulation if site specific review documents that old growth characteristics have changed since originally inventoried. In this case, the portion of the old growth area polygon that does not meet old growth definitions may be removed from this stipulation requirement.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 3. WILDLIFE AND AQUATIC RELATED STIPULATIONS AND NOTICES

# 3.1 Mexican Spotted Owl

#### 3.1.1 Lease Notice

A survey of the lease area may be required to determine if unsurveyed suitable habitat is present, and the agencies should prioritize completing surveys where expressions of interest have been made for leasable mineral development. A 2-year protocol survey to determine occupation by the species would be required prior to any development activity within the identified suitable habitat. Surveys would be completed by a qualified biologist as determined by USFWS and the managing agencies. No development activity would take place in resultant occupied habitat until a determination is made by the USFWS and the managing agencies for designation of a protected activity center.

#### 3.1.2 No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** In Mexican spotted owl habitat, as determined by biologist at the time, NSO would be allowed. Surveys of the lease area may be required to determine the presence of suitable habitat, occupation, and, if warranted, designation determination for a protected activity center.

If it is determined that suitable nesting and fledgling Mexican spotted owl habitat exists and surveys cannot be conducted, a TL would be placed from March 1 to August 31.

**For the purpose of:** Preventing actions which may result in take as defined under the Endangered Species Act.

**Justification:** The Mexican spotted owl is a threatened species with suitable habitat within portions of the SJNF and TRFO lands. NSO would be allowed in these habitat areas to maintain the utility of suitable breeding and brood rearing habitat as defined in the Mexican Spotted Owl Recovery Plan to promote recovery.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupancy. No exceptions would be granted within a protected activity center.

**Modifications:** The Authorized Officer may modify habitat configuration or extent based on new information. Modification of a protected activity center would be completed in consultation with the USFWS.

**Waivers:** A waiver of this stipulation maybe granted by the Authorized Officer only through a land use plan amendment. No waivers shall be granted within designated protected activity centers.

# 3.2 Lynx

# 3.2.1 Controlled Surface Use – Landscape Linkage, Denning and Winter Foraging Habitat

Surface occupancy or use is subject to the following special operating constraints: Limitations on surface use and/or operational activities may be required. TL (especially during winter and/or in lynx habitat) and restrictions on snow compaction activities may be applied in consultation with the USFWS as necessary to protect habitat and linkage area function and limit access by potential lynx competitors. Actions would be consistent with direction found in the Lynx Conservation Assessment and Strategy, best available science as determined by the managing agencies and the USFWS, and/or the Southern Rockies Lynx Amendment, each where applicable.

#### On the lands described below:

- Within identified current active denning locations
- Within identified landscape linkage areas
- Within identified lynx habitat in a Lynx Analysis Unit (LAU)

For the purpose of: Protection of lynx and lynx habitat in compliance with the Endangered Species Act.

**Justification:** The Canada lynx is a threatened species, with suitable habitat within portions of the SJNF and TRFO. CSU would apply in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the USFWS, may grant an exception to this stipulation if an environmental analysis and subsequent consultation indicates that the proposed or conditioned activities would not affect, current and subsequent, suitability or utility of established lynx linkage corridors or lynx habitat within the LAU.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is non-essential to function and utility of established lynx linkage corridors and lynx habitat, and not impair the utility of the corridors and LAU for current or subsequent lynx use or occupation.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS, only through a land use plan amendment if site conditions have changed sufficient to preclude current and subsequent lynx occupation of the LAU or use of linkage corridors.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.2.2 Timing Limitation – Denning Sites

No surface use is allowed during the following time period on the lands described below: March 1 to August 30 (this stipulation applies to all lease activities) within 1 mile of known, active den sites.

**For the purpose of:** Protection of denning habitat for Canada lynx in compliance with the Endangered Species Act.

**Justification:** The Canada lynx is a threatened species with suitable habitat within portions of the SJNF and TFRO. A TL would apply in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupation.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size of the stipulation area or time frames if an environmental analysis shows that the modification would not impair the utility of the habitat and LAU for current or subsequent lynx reproductive activity or occupation.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.3 Southwestern Willow Flycatcher

#### 3.3.1 No Surface Occupancy

No surface occupancy is allowed on the lands described below: Within 325 feet of the ordinary high water mark in mapped habitat.

For the purpose of: Prevent disruption of reproductive activity in mapped habitat.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer in consultation with the USFWS, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect current or subsequent suitability or utility of riparian habitat suitable for the southwestern willow flycatcher.

**Modifications:** The Authorized Officer in consultation with the USFWS, may modify the configuration of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is currently and subsequently nonessential to the function and utility of riparian habitat, or that the Proposed Action could be conditioned so as not to impair the utility of habitat for the southwestern willow flycatcher.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.3.2 Timing Limitation

**No surface use is allowed during the following time period(s):** May 1 to August 15 in mapped suitable nesting habitat.

For the purpose of: Prevent disruption of reproductive activity during the production period.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the USFWS, may grant an exception if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current of subsequent nest attendance, egg/chick survival, or nesting success. Seasonal time frames may be modified if operations could be conditioned to not disrupt current or subsequent breeding behavior and bird distribution within suitable breeding habitat.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.4 Gunnison Sage-grouse

#### 3.4.1 Lease Notice

The lease may in part, or in total contain critical Gunnison sage-grouse habitat, as identified by the managing agencies, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas or geothermal operations on Gunnison sage-grouse populations and habitat quality.

Sage-grouse habitat conservation measures may include timing restrictions, noise restrictions, distances or percentages of allowable surface-disturbing activities, and desired density levels or other development constraints consistent with the state or Gunnison Sage-grouse Rangewide Conservation Plan (including subsequent updates), current peer reviewed sage-grouse research, or as developed in conjunction with CPW to meet local population objectives.

Such measures shall be developed during the Application for Permit to Drill on-site and environmental review process for sundry notices and associated rights-of-way, and would be consistent with lease rights granted.

# 3.4.2 No Surface Occupancy – Occupied Habitat

**No surface occupancy is allowed on the lands described below:** as mapped for occupied critical Gunnison sage-grouse habitat.

For the purpose of: Protecting priority habitat such as lek sites and nesting habitat for Gunnison sagegrouse.

**Justification:** Development and human activity are known to be limiting to occupation and successful reproduction of this species within its complex of suitable habitat. NSO may be used in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may be considered.

**Modifications:** A modification may be granted by the Authorized Officer if the occupied habitat boundaries change.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changed may be in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.4.3 Controlled Surface Use – Occupied Habitat

*Surface occupancy or use is subject to the following special operating constraints:* The Field Manager may require the proponent/applicant to submit a plan of development that would demonstrate:

- Avoidance of direct or indirect loss of important Gunnison sage-grouse habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important Gunnison sage-grouse habitat necessary for sustainable local populations.
- Special reclamation measures or design features are incorporated that would accelerate recovery and/or re-establishment of affected sage-grouse habitat;
- The current/future utility of such habitat for sage-grouse use would not be impaired.

Additional conservation measures may be imposed as necessary to maintain high-quality sage-grouse habitat, reduce fragmentation or loss of habitat within or between population areas, reduce cumulative effects within population areas, and reduce disturbance to sage-grouse use in the area. Conservation measures may be identified in state or local conservation plans or through appropriate science or research for the species.

**Justification:** Loss of habitat is known to be among the factors limiting successful breeding, reproduction, and recruitment of this species within otherwise suitable habitat. The BLM and USFS, signatories to the Gunnison Sage-grouse Range-wide Conservation Plan (2005), have made commitments to limit noise associated with anthropogenic sources within priority habitats consistent with the LRMP.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in coordination with CPW, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the long term suitability or utility of habitat for sage-grouse.

Modifications: May be considered

**Waivers:** The Authorized Officer, in coordination with CPW, may grant a waiver to this stipulation if site conditions have changed sufficient to permanently preclude sage-grouse occupation of the lease area.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.4.4 Controlled Surface Use – Unoccupied Habitat

Surface occupancy or use is subject to the following special operating constraints: In unoccupied Gunnison sage-grouse habitat, NSO would be allowed within a 0.6-mile radius of a newly identified lek site. A TL may be applied to lease activities if surface occupancy is allowed. A TL may apply to construction, drilling, and workovers within 4.0 miles of an identified lek site from March 1 through June 30, dependent on the distribution of suitable nesting habitat and line of sight from the activity to the lek (potential habitat as identified in the Gunnison Sage Grouse Rangewide Plan, 2005). These are areas where Gunnison sage-grouse use is suspected or the habitat is deemed suitable but no grouse have been documented there. An agency approved survey of the lease acreage within "potential" habitat may be required to verify occupancy status.

For the purpose of: Protecting crucial habitat such as lek sites and nesting habitat for Gunnison sagegrouse.

**Justification:** The Gunnison sage-grouse is a BLM and USFS sensitive species, with suitable habitat and populations within portions of the SJNF and TRFO lands. Development and human activity are known to be limiting to occupation and successful reproduction of this species within its complex of suitable habitat. NSO may be used in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception if an environmental analysis and coordination with CPW indicate that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success. Actions designed to enhance the long-term utility or availability of nest habitat may be excepted.

**Modifications:** A modification may be granted by the Authorized Officer if the suitable habitat boundaries change. The Authorized Officer may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent nest attendance, egg/chick survival, or nesting success. Seasonal or daily time frames may be modified if operations to not disrupt current or subsequent lek attendance, breeding behavior, and bird distribution within a 0.6-mile radius of the lek during the breeding period (March 1–June 30).

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.4.5 Controlled Surface Use – Noise Restriction Occupied and Unoccupied Habitat

Surface occupancy or use is subject to the following special operating constraints: New noise sources resulting from management activities must not contribute to noise levels exceeding 34 A-weighted decibels (dBA) (10 dBA above ambient measures, typically 20 to 24 dBA) from 6 p.m. until 9 a.m. at the perimeter of a lek during active lek season.

In occupied habitat the BLM would not authorize vehicular traffic between the hours of 6 p.m. and 9 a.m. within 1.9 miles of a lek from March 15 through May 15 annually. This stipulation applies to vehicles that may create noise levels that exceed recommended guidance.

**For the purpose of:** Protecting priority habitats such as lek sites, nesting, brood rearing, and winter habitat for Gunnison sage-grouse in order to prevent abandonment of display grounds and to maintain reproductive success, recruitment, and survival.

**Justification:** Noise associated with oil and gas operations and other similar development activity is known to be among the factors limiting successful breeding, reproduction and recruitment of this species within otherwise suitable habitat. The BLM and USFS, signatories to the Gunnison Sage-grouse Rangewide Conservation Plan (2005), have made commitments to limit noise associated with anthropogenic sources within priority habitats consistent with the Plan.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the agency wildlife biologist and CPW, may grant an exception to this stipulation if other measures have been implemented sufficient to reduce the

noise levels at the edge of the 0.6-mile lek buffer to a maximum of 10 dBA above ambient noise levels (measured at dawn) in an undeveloped area with no other anthropogenic sources of noise.

**Modifications:** A modification may be granted by the Authorized Officer if the lek and associated habitat boundaries change for this species.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.5 Columbian Sharp-tailed Grouse

#### 3.5.1 No Surface Occupancy – Lek Sites

No surface occupancy or use is allowed on the lands described below: Within a 0.4-mile buffer of a lek site.

**For the purpose of:** Protecting lek sites for Columbian sharp-tailed grouse in order to prevent abandonment of display grounds and allow for successful reproduction.

**Justification:** Historic habitat for Columbian sharp-tailed grouse covered a large portion of the lowerelevation range and mountain shrub communities throughout the SJNF and TRFO planning area. The species may occur within an area known to contain oil and gas resources. Development and human activity are known to limit successful reproduction and the occupation of otherwise suitable habitat by this species. NSO within 0.4 mile of known lek sites is necessary to ensure continued occupation of leks and successful reproduction for Columbian sharp-tailed grouse.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may be considered.

**Modifications:** A modification may be granted by the Authorized Officer if the lek and associated habitat boundaries change for this species.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.5.2 Controlled Surface Use – Noise Restriction

Surface occupancy or use is subject to the following special operating constraints: New noise sources resulting from management activities must not contribute to noise levels exceeding 34 dBA (10 dBA above ambient measures, typically 20 to 24 dBA) from 6 p.m. until 9 a.m. at the perimeter of a lek during active lek season.

In occupied habitat the BLM would not authorize vehicular traffic between the hours of 6 p.m. and 9 a.m. within 1.9 miles of a lek from March 15 through May 15 annually. This stipulation applies to vehicles to vehicles that may create noise levels that exceed recommended guidance.

**For the purpose of:** Protecting priority habitats such as lek sites, nesting, brood rearing, and winter habitat for Gunnison sage-grouse in order to prevent abandonment of display grounds and to maintain reproductive success, recruitment, and survival.

**Justification:** Historic habitat for Columbian sharp-tailed grouse covered a large portion of the lowerelevation range and mountain shrub communities throughout the SJNF and TRFO planning area. The species may occur within an area known to contain oil and gas resources. Noise associated with oil and gas operations and other similar development activity is known to be among the factors limiting successful breeding, reproduction and recruitment of this species within otherwise suitable habitat.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the agency wildlife biologist and CPW, may grant an exception to this stipulation if other measures have been implemented sufficient to reduce the noise levels at the edge of the 0.4-mile lek buffer to a maximum of 10 dB above ambient noise levels (measured at dawn) in an undeveloped area with no other anthropogenic sources of noise.

**Modifications:** A modification may be granted by the Authorized Officer if the lek and associated habitat boundaries change for this species.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.5.3 Timing Limitation – Noise Restriction

Surface occupancy or use is subject to the following special operating constraints: A TL may apply to construction, drilling, and workovers within 1.25 miles of an identified lek site from March 15 through July 30, dependent on the distribution of suitable nesting habitat and line of sight from the activity to the lek. An agency-approved survey of the lease acreage within suitable habitat may be required to verify occupancy status.

**For the purpose of:** Protecting crucial habitat such as lek sites and nesting habitat for Columbian sharptailed grouse.

**Justification:** The Columbian sharp-tailed grouse is a BLM sensitive species, with suitable habitat and populations within portions of the SJNF and TRFO. Development and human activity are known to be limiting to occupation and successful reproduction of this species within its complex of suitable habitat. NSO may be used in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception if an environmental analysis and coordination with CPW indicate that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success. Actions designed to enhance the long-term utility or availability of nest habitat may be excepted.

**Modifications:** A modification may be granted by the Authorized Officer if the suitable habitat boundaries change. The Authorized Officer may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent nest attendance, egg/chick survival, or nesting success. Seasonal or daily time frames

may be modified if operations to not disrupt current or subsequent lek attendance, breeding behavior, and bird distribution within a 0.4-mile radius of the lek during the breeding period (March 1–July 30).

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.6 Colorado River Cutthroat Trout

#### 3.6.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within 0.25 mile of streams occupied by conservation populations of Colorado River cutthroat trout or streams that have been identified as reintroduction sites for Colorado River cutthroat trout.

For the purpose of: Protection of existing Colorado River cutthroat trout populations and habitat.

**Justification:** To assist in the recovery and conservation of Colorado River cutthroat trout populations in accordance with the 2001 Conservation Agreement and Strategy for the States of Colorado, Utah, and Wyoming. This species is both a USFS and BLM sensitive species. The Colorado River cutthroat trout is the only salmonid species native to western Colorado. Populations of cutthroat have declined over the past 100 years to where they now occur less than 5% of the area once occupied. The introduction of non-native trout species is the primary cause of the decline of endemic cutthroats. However, a variety of land management activities, resulting in the loss or degradation of their habitat, have also contributed to the declines. The declines have been so severe that this subspecies of cutthroat has been petitioned for listing under the Endangered Species Act. The above stipulation would help promote the long-term recovery of the species and help reduce the trend towards federal listing.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions to this stipulation may be authorized if the affected area is determined not to be suitable habitat. Exceptions may also be granted when surface occupancy within the 0.25-mile distance of the Colorado River cutthroat trout conservation population or reintroduction sites would have no potential for adverse impacts on the habitat or population. Although these situations would be very rare, the Authorized Officer shall consider topography, hydrology, timing of surface activities, and all other relevant factors when evaluating an exception request.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 3.7 Greenback Cutthroat Trout

#### 3.7.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Within 0.25 mile of streams occupied by existing populations of greenback cutthroat trout.

**For the purpose of:** Protection of existing greenback cutthroat trout populations in compliance with the Endangered Species Act.

**Justification:** To assist in the protection of greenback cutthroat trout populations.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions can also be granted when surface occupancy within the 0.25-mile distance of the greenback cutthroat trout populations would have no potential for adverse impacts on the population. Although these situations would be very rare, the Authorized Officer shall consider topography, hydrology, timing of surface activities, and all other relevant factors when evaluating an exception request.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.8 Migratory Birds

#### 3.8.1 Lease Notice

Avoid or minimize disruption of migratory bird nesting activity by siting or prioritizing vegetation clearing, facility construction, and concentrated operational activities (e.g., drilling, completion, utility installation) to avoid the involvement of higher value migratory bird habitats, particularly during the core migratory bird nesting season (April 1–July 15).

# 3.9 Eagles, All Accipiters, Falcons, Buteos, and Owls\*

# 3.9.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within specified distance from nest and communal winter roost sites, NSO would be allowed. Distances are listed in Table H.3.

For the purpose of: Provide adequate nesting and roost sites to support species populations.

**Justification:** These raptor species are known to have failed reproduction and abandon nests and communal winter roost sites when human activity occurs within the specified buffer distances from these sites. To increase the likelihood of successful reproduction and recruitment of these species, and to provide adequate roost sites for utilization of their habitat, NSO would be permitted within the specified buffer distances from nest and roost sites (see Table H.3).

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest for current or subsequent nesting activity or occupancy. An exception may be granted by the Authorized Officer, consistent with policies derived from federal administration of the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

**Modification:** The Authorized Officer may modify the stipulation buffer distances or substitute with a timing limitation if an environmental analysis indicates that a portion of the area is non-essential to nest utility or function, or that the Proposed Action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. A modification may be granted if the nest has remained unoccupied for a minimum of five years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

**Waiver:** The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of site occupation within the lease area.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.9.2 Timing Limitation

**No surface use is allowed during the following time period(s):** A TL would be applied to lease activities, if surface occupancy is allowed. The TL would apply to all development activities (construction, drilling, workovers, operation, and maintenance). The duration of the timing limitation is species-dependent, and the timing limitation subject to this stipulation are shown in Table H.3.

#### For the Purpose of:

**Justifications:** These raptor species are known to have failed reproduction and abandon nests and communal winter roost sites when human activity occurs within the specified buffer distances from these sites. To increase the likelihood of successful reproduction and recruitment of these species, and to provide adequate roost sites for utilization of their habitat, NSO would be permitted within the specified buffer distances from nest and roost sites (see Table H.3).

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action indicated that nature or conduct of the activity could be conditioned so as not to impair the utility of the nest for current or subsequent nesting activity or occupancy.

An exception may be granted by the Authorized Officer to these dates if an agency biologist verifies that the nest site is unattended for the current season and it is late enough in the season to assure that the species would not utilize the nest for re-nesting activities following a failure at this or alternate nest sites.

The Authorized Officer may also grant an exception to these dates for the eagle species by the Authorized Officer, if authorization is obtained from the USFWS (through applicable provisions of the Bald and Golden Eagle Protection Act) to harass, harm, wound, or kill in the context of active nesting attempts.

**Modifications:** This lease stipulation dates and buffer distances may be modified by the Authorized Officer if an environmental analysis indicates that more accurate dates and buffer distances, as recognized by the managing agencies and CPW, are available for the raptor species in the planning area.

**Waivers:** A waiver may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions change such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

**Table H.3: Raptor Conservation Measures** 

Species	Impact/Risk	Time Frame	Buffer Distance Restrictions	Reference
Golden eagle	Disturbance	December 15– July 15	Project-related activity should not occur within a 0.5 mile of nest during nesting season. (G)	CPW 2008
Golden eagle	Structural improvements *	Year round	New structures must not occur within 0.5-mile radius of active nest. (S)	CPW 2008
Bald eagle	Disturbance	November 15– July 15	Project-related activity should not occur within 0.5 mile of nest during nesting season. (G)	SJNF and TRFO
Bald eagle	Structural improvements *	Year round	New structures must not occur within a 0.5-mile radius of active nest. (S)	SJNF and TRFO
Bald eagle	Disturbance	November 15– March 15	Project-related activity should not occur within a 0.25-mile radius (indirect line of sight) or a 0.5-mile radius (direct line of sight) of communal winter roost site.  Limit activity between 1000 and 1400 hours if encroachment would occur within buffer zones.  (G)	CPW 2008
Bald eagle	Structural improvements *	Year round	New structures must not occur within 0.5 mile of communal roost site (S)	SJNF and TRFO
Bald eagle	Disturbance and structural improvements *	Site specific, to be determined by the project biologist	For preferred diurnal hunting perch	CPW 2008
Osprey	Disturbance **	April 1–August 31	Project-related activity should not occur within a 0.25-mile of nest during nesting season.	SJNF and TRFO
Osprey	Structural improvements *	Year-round	New structures should not occur within a 0.25-mile radius of active nest. (G)	CPW 2008
Red-tailed hawk	Disturbance	March 1–July 15	Project-related activity should not occur within 0.125 to 0.25 mile of nest during nesting season, as determined by the project biologist. (G)	SJNF and TRFO
Red-tailed hawk	Structural improvements *	Year-round	New structures should not occur within 0.25-mile radius of active nest. (G)	SJNF and TRFO
Peregrine falcon	Disturbance	March 15–July 31	Project-related activity should not occur within 0.5 mile of nest during nesting season.	CPW 2008
Peregrine falcon	Structural improvements *	Year-round	New structures must not occur within 0.5 mile radius of active cliff nest complex. (S)	CPW 2008
Prairie falcon	Disturbance	March 15–July 15	Project-related activity should not occur within 0.5 mile of nest during nesting season. (G)	CPW 2008

Species	Impact/Risk	Time Frame	Buffer Distance Restrictions	Reference
Prairie falcon	Structural improvements *	Year-round	New structures must not occur within a 0.5-mile radius of active nest.	CPW 2008
Northern goshawk	Disturbance	March 1– August 31	Project-related activity should not occur within 0.5 mile of nest during nesting season. (G)	SJNF and TRFO
Northern goshawk	Structural improvements *	Year-round	New structures should not occur within a 0.5-mile radius of active nest. (G)	CPW 2008
Burrowing owl	Disturbance	March 15– August 15	Project-related activity should not occur within 0.25 mile of nest burrows when owls may be present during nesting season. (G)	SJNF and TRFO
Burrowing owl	Structural improvements *	Year-round	New structures should not occur within a 0.25-mile radius of active nests or within occupied habitat. (G)	Romin and Muck 2002
All other accipter, buteo, falcon, harrier, and owls	Disturbance **	Varied by species	Determination of the application of these specific seasonal restrictions, TL, and/or buffer distances should be made by the project biologist, guided by agency requirements, along with professional knowledge and experience. They would be considered on a case by case basis, taking into consideration site-specific factors such as topography, vegetation, species of raptor, historic patterns of human activity and infrastructure, and observed behaviors of individual birds (G)	Romin and Muck 2002
All other accipter, buteo, falcon, harrier, and owls	Structural improvements *	Varied by species	Determination of the application of these specific seasonal restrictions, TL, and/or buffer distances should be made by the project biologist, guided by agency requirements, along with professional knowledge and experience. They would be considered on a case by case basis, taking into consideration site-specific factors such as topography, vegetation, species of raptor, historic patterns of human activity and infrastructure, and observed behaviors of individual birds. (G)	Romin and Muck 2002

<sup>\*</sup> Structures include improvements such as roads, radio towers, oil wells, etc., proposed following nest establishment and is not intended to include structures that historically occurred in the area.

Note: "S" indicates an LRMP standard and "G" indicates an LRMP guideline.

<sup>\*\*</sup> This does not apply to historic levels and patterns of disturbance under which the nest was established and is intended to apply to additional levels and change in disturbance patterns.

## 3.10 Big Game

#### 3.10.1 Timing Limitation – Parturition

No surface use is allowed during the following time period(s): In areas mapped as big game parturition areas for:

- Pronghorn antelope fawning areas (on SJNF and TRFO lands this includes the overall range for the species): May 1 through July 1
- Elk calving areas: May 15 through June 30
- Rocky Mountain bighorn sheep lambing: April 15 through June 30
- Desert bighorn sheep lambing: February 1 through May 1

**For the purpose of:** Parturition areas are critical habitat in maintaining herd sustainability. Disturbance during critical times can result in mortality and loss of reproductive recruitment into the population.

Justifications: In order to reduce behavioral disruption during parturition and early young rearing period.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the staff wildlife biologist and coordination with CPW, may grant an exception to this stipulation if an environmental analysis indicates that the Proposed Action can be conditioned so as not to currently or subsequently interfere with habitat function or compromise animal condition and reproduction within the project vicinity and/or to conduct maintenance and operations limited to those activities that do not currently or subsequently result in, or contribute to, mortality, condition loss, or reproductive failure.

**Modifications:** A modification may be granted by the Authorized Officer if the suitable habitat boundaries change as defined by CPW and managing agency wildlife biologist.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 3.10.2 Controlled Surface Use –Severe Winter Range, Winter Concentration and Mule Deer Critical Winter Range and Big Game Production Areas

Surface occupancy or use is subject to the following special operating constraints: In order to provide for healthy ungulate populations capable of meeting state population objectives, anthropomorphic activity and improvements should be designed to maintain and continue to provide effective habitat components that support critical life functions. This includes components of size and quality on the landscape providing connectivity to seasonal habitats (wildlife travel corridors), production areas, severe winter range, and winter concentration areas, along with other habitat components necessary to support herd viability.

**For the purpose of:** Protecting priority habitats such as winter concentration areas for big game in order to prevent abandonment of critical habitat, and to maintain reproductive success, recruitment, and survival.

**Justification:** There is a growing body of evidence that TL stipulations on oil and gas development activities are not adequate to protect critical winter habitat and migratory corridors for big game. Managing the concentration and development such as drilling, construction, and the density of surface

facilities may be necessary to maintain big game populations in developing areas. Examples may include surface disturbance caps, collocation of facilities, and central gathering facilities, noise reduction, and efforts to minimize traffic and road densities. Routine production activities would be allowed, however workover activities should be handled on a case by case basis.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the agency wildlife biologist and CPW, may grant an exception to this stipulation if other measures have been implemented sufficient to reduce or compensate for the loss in habitat effectiveness.

**Modifications:** A modification may be granted by the Authorized Officer if the associated habitat boundaries change for this species.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.10.3 Timing Limitation –Winter Range

**No surface use is allowed during the following time period(s):** In mapped big game severe winter range, winter concentration areas, and mule deer critical winter habitat:

- Pronghorn antelope: December 1 through April 30
- Rocky Mountain bighorn sheep: November 1 through April 15
- Desert bighorn sheep: December 1 through April 15
- Mule deer: December 1 through April 30
- Elk: December 1 through April 30

**On the lands described below:** Big game severe winter range, winter concentration areas, and mule deer critical winter range as defined by CPW and managing agency wildlife biologist.

**For the purpose of:** Protecting winter range to reduce behavioral disruption of big game during the winter season, which can result in mortality to the species.

**Justification:** In order to reduce behavioral disruption during parturition and early young-rearing period.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception during mild winter conditions through December 31, specifically for elk and deer, when animals are less likely to be dependent on winter concentration areas and severe winter range. The exception would be based on severity of the winter in consultation with the staff wildlife biologist and coordination with CPW concerning weather patterns, snow depth at higher elevation, snow crusting, daily mean temperatures, and animal distribution.

The Authorized Officer may grant an exception for a species if an environmental analysis indicates that the Proposed Action can be conditioned so as not to interfere with current or subsequent habitat function or compromise animal condition and health within the project vicinity.

The Authorized Officer, in consultation with the staff wildlife biologist and in coordination with CPW, may also grant an exception to this stipulation to conduct maintenance and operations limited to those activities that would not currently or subsequently interfere with habitat function or compromise animal condition and health within the project vicinity.

**Modifications:** A modification may be granted by the Authorized Officer if an environmental assessment, in coordination with CPW shows the annual necessary closure dates or boundaries of critical winter range have changed for a species.

**Waivers:** A waiver of this stipulation maybe granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.11 Gunnison Prairie Dog

#### 3.11.1 Controlled Surface Use

**Surface occupancy or use is subject to the following special operating constraints:** A survey of the lease area may be required to determine occupation of Gunnison prairie dog. Development of lease parcels that include prairie dog towns would require one or more of the following conservation measures prior to and during lease development:

- Develop a surface use plan of operations with the managing agencies that integrates and coordinates long-term lease development with measures necessary to minimize adverse impacts to prairie dog populations or their habitat.
- Abide by special daily and seasonal restrictions on construction, drilling, product transport, and service activities during the reproductive period (March 1–June 15).
- Incorporate special modifications to facility siting, design, construction, and operation, or NSO to minimize involvement of prairie dog burrow systems.

**For the purpose of:** Maintaining the integrity and extent of prairie dog complexes, and protecting high value wildlife habitat and recreation values associated with designated state wildlife areas.

**Justification:** Gunnison prairie dog is a designated sensitive species by the managing agencies and a keystone species for the ecosystem.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the current and subsequent suitability or utility of the habitat for prairie dogs. Surface disturbance and occupation may also be authorized in the event that established impacts to habitat values would be compensated or offset to the satisfaction of the managing agencies in coordination with CPW.

**Modifications:** The NSO area may be modified in extent, by the Authorized Officer in coordination with CPW, if an environmental analysis finds that a portion of the area is non-essential to site utility or function, or that the Proposed Action could be conditioned so as not to impair the current or future values of the site.

**Waivers:** The Authorized Officer may grant a waiver to this stipulation if the site conditions have changed sufficient to preclude current and subsequent occupation of the stipulation area.

#### 3.12 Bats

#### 3.12.1 Lease Notice

A bat inventory may be required prior to approval of operations within historic mining complexes or other important identified suitable habitat. These are areas where bats are suspected or the habitat is deemed suitable but no bats have been documented. The inventory data would be used to apply conservation measures to reduce the impacts of surface disturbance on bat habitat. If bats are found during the inventory, then the NSO stipulation would apply to protect the sensitive bat species' maternity roosts and hibernacula.

#### 3.12.2 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within a 0.25-mile radius of known maternity roosts or hibernacula of BLM and USFS sensitive bat species.

For the purpose of: Protection of known sensitive bat species' maternity roosts and hibernacula.

**Justification:** Woodlands including pinyon-juniper and coniferous and riparian areas adjacent to old mine adits and caves provide important roosting and foraging habitat for BLM and USFS sensitive bat species. Protection of habitat in these areas can help prevent a trend towards federal listing and contribute to conservation of the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted by the Authorized Officer if an environmental analysis of the Proposed Action indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of these features for current or subsequent reproductive activity, overwinter activity, or occupancy.

**Modifications:** The Authorized Officer may modify the stipulation buffer distance if an environmental analysis indicated that a portion of the area is non-essential to maintaining current or subsequent reproductive and winter use.

**Waivers:** A waiver may be granted if the feature is no longer capable of supporting current or subsequent reproductive and overwinter activities.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 3.13 State Wildlife Areas

## 3.13.1 No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** In state wildlife areas that have federal mineral estate underlying them. NSO and other mitigations would be determined by the managing Agencies in cooperation with CPW. For Perins Peak state wildlife area, this NSO includes the adjacent BLM lands that in combination comprise the Perins Peak Habitat Management Area.

For the purpose of: Protect high value wildlife habitat and recreation values associated with designated state wildlife areas.

**Justification:** The State of Colorado is a partner in natural resource management. Many state wildlife areas were purchased and established utilizing federal dollars to accomplish common management objectives complementing similar managements on the planning area.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted or substituted with a TL, by the Authorized Officer in coordination with CPW, if an environmental analysis determines that the action, as proposed or conditioned, would not impair the values of the state wildlife area.

**Modifications:** The NSO area may be modified in extent, by the Authorized Officer in coordination with CPW, if an environmental analysis finds that a portion of the area is non-essential to site utility or function, or that the Proposed Action could be conditioned so as not to impair the current or future values of the site.

Waivers: This stipulation may be waived if CPW disposes of the site.

# 4. CULTURAL, HISTORIC, RECREATION, AND SCENERY RELATED STIPULATIONS AND NOTICES

#### 4.1 Cultural Resources

#### 4.1.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Areas as mapped for:

- Spring Creek National Register District
- Lost Canyon National Register District
- Saul's Creek Proposed National Register District
- Peterson Gulch Proposed National Register District
- Turkey Creek Proposed National Register District
- Armstrong Ritter Proposed National Register District
- Mesa Verde Escarpment
- Anasazi remnant, aka Mud Springs
- Bull Canyon Rock Shelter
- Indian Henry's Cabin

The lessee is prohibited from surface occupancy and surface-disturbing activities within a 100-meter-wide protection boundary around known eligible cultural resources, traditional cultural properties, listed National Register of Historic Places (NRHP) sites/districts, outstanding cultural resources to be nominated to the NRHP, interpreted and/or public use sites, and experimental-use sites (BLM Manual 8110.42(A-E).

For the purpose of: Protecting cultural resource sites that may be damaged from inadvertent, unauthorized, or authorized uses. The following characteristics are to be protected: 1) significant scientific information, 2) areas that contain dense concentrations of significant sites, 3) integrity of physical setting, 4) integrity of visual setting associated with a place and/or cultural landscape, and 5) recreational opportunity for public use sites. Mitigation using data recovery is typically not an option for traditional cultural properties, sites set aside for long-term conservation, and interpreted and/or public use sites.

Justification: Development of oil and gas leases with these NRHP districts, proposed NRHP districts, and outstanding cultural areas is not compatible with the preservation of these resources and would result in irreversible impacts to these important non-renewable resources. These areas contain dense concentrations of highly significant resources that have been listed as NRHP districts or have been proposed as NRHP districts. The Mesa Verde Escarpment and the Anasazi Remnant (also known as Mud Springs) were initially slated for inclusion in the Canyon of the Ancients National Monument. They were excluded because they were discontinuous parcels and other management concerns. However, the archaeological sites on these lands are of equal significance and concentration as those with the Canyon of the Ancients National Monument. Because of their significance and sensitivity, Bull Canyon Rock Shelter and Indian Henry's Cabin were designated as NSO in the 1985 San Juan/San Miguel Resource and Management Plan, and continue to be protected in the current LRMP. Oil and gas development in the vicinity of these sites would adversely affect the historic setting and landscape associated with these sites.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the site, e.g., where topography, changes in elevation, etc., would physically isolate development form impacting the site.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 4.2 Horse Range Mesa Paleontological Site

#### 4.2.1 No Surface Occupancy

The lessee is prohibited from surface occupancy and surface-disturbing activities within 100 meters around all known scientifically important paleontological resources.

**No surface occupancy or use is allowed on the lands described below:** Area as mapped for Horse Range Mesa paleontological site in the SW¼ NE¼, NW¼ SE¼ of Section 15, Township 44 North, Range 19 West, New Mexico Principal Meridian, San Miguel County, Colorado.

**For the purpose of:** Protecting the. This stipulation is to protect scientific information associated with the Horse Range Mesa vertebrate fossil resource that may be damaged from inadvertent or authorized uses

**Justification:** The Horse Range Mesa paleontological site has been recognized (Stadtman 1989) for the significance of the non-renewable vertebrate fossil resource where development has the potential to cause irreversible disturbance and damage. A NSO stipulation has been in effect since 1991 with the approval of the oil and gas amendment to the San Juan/San Miguel Resource Management Plan and continues in the current LRMP. Authority for this protection is the American Antiquities Act of 1906 (16 United States Code [USC] 431–433).

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the site, e.g., where topography, changes in elevation, etc., would physically isolate development form impacting the site.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

# 4.3 Viewshed, Auditory, and Night Sky Protection for Chimney Rock National Monument

#### 4.3.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Mapped area of the Chimney Rock viewshed and night sky horizon, and within auditory range of the interpreted archaeological area.

**For the purpose of:** Protection of the scenic and cultural integrity of the viewshed, night sky, and auditory environment of the Chimney Rock National Monument

**Justification:** The Chimney Rock Archaeological Area contains unique and very significant archaeo-astronomical alignments that are dependent on undisturbed views and night sky of the horizon from numerous points within the archaeological area. These sites and their associated landscape, viewshed, and night sky also have significant traditional cultural property values for Native American groups.

As a significant traditional cultural property and publically interpreted site the auditory environment of the Chimney Rock Archaeological Area is an important part of the cultural practioner's and visitor's experience.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be made to this NSO stipulation if the proposed occupancy can demonstrate that it can be developed in a manner that is not visually evident in the Chimney Rock foreground and middle-ground viewshed and night sky, and is not audible from the interpreted archaeological area.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 4.4 Viewshed for the Glade Guard Station and the Aspen Guard Station

#### 4.4.1 Controlled Surface Use

**Surface occupancy or use is subject to the following special operating constraints:** Mapped area of the viewsheds for the Glade Guard Station and the Aspen Guard Station.

**For the purpose of:** Protection of the scenic and cultural integrity of the viewsheds of the Glade Guard Station and the Aspen Guard Station.

**Justification:** The Glade Guard Station and the Aspen Guard Station are significant heritage resources. The undeveloped historic viewsheds of these resources are important components of the integrity of these sites—the integrity of setting, feeling, and association of the historic Guard Stations. Additionally the Aspen Guard Station is a recreation rental site and the Glade Guard Station is a proposed recreation

rental site. The visitor experience of solitude and nature would be severely diminished through oil and gas development within their viewsheds.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be made to this CSU stipulation if the proposed occupancy can demonstrate that it can be developed without impact to the integrity of the historic setting, feeling and association within the foreground and middle-ground viewsheds of the Glade Guard Station and the Aspen Guard Station.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 4.5 Old Spanish National Historic Trail

#### 4.5.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** The lessee is prohibited from surface occupancy and surface-disturbing activities up to 0.5 mile of either side of the centerline of the congressionally designated trail in high potential segments.

**For the purpose of:** The stipulation is to protect the physical evidence of the trail, the cultural and historic resources associated with the trail, and the integrity of the viewshed associated with the trail that may be damaged from inadvertent, unauthorized, or authorized uses.

**Justification:** The purpose of this stipulation is to protect the integrity of viewsheds in scenic and cultural landscapes along the Old Spanish National Historic Trail. Typically these foreground viewsheds are the most sensitive in terms of visitor expectations for high-quality scenery and an environment that is compatible with the special route designation. The visible evidence of oil and gas development is inconsistent with the maintenance of high scenic integrity in the foreground of these trails. Development associated with fluid minerals development is not a valued cultural element in the viewshed.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the site, e.g., where topography, changes in elevation, etc., would physically isolate development form impacting the site.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

Waivers: This stipulation may be waived if the road or trail is found not to exist within the lease area

#### 4.5.2 Controlled Surface Use

**Surface occupancy or use is subject to the following special operating constraints:** An operating plan would be required demonstrating how impacts would be mitigated up to the horizon on either side of the centerline of the congressionally designated trail in high potential segments.

**For the purpose of:** The BLM may require modification to exploration or development proposals to protect such properties or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated extending to the horizon on either side of the centerline of the congressionally designated trail.

**Justification:** The stipulation is to protect the physical evidence of the trail, the cultural and historic resources associated with the trail, and the integrity of the viewshed associated with the trail that may be damaged from inadvertent, unauthorized, or authorized uses.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface disturbing activity would not cause adverse impacts or would have negligible impacts to the site, e.g., where topography, changes in elevation, etc., would physically isolate development form impacting the site.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

Waivers: This stipulation may be waived if the trail is found not to exist within the lease area.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 4.6 Developed Administrative and Recreation Sites

#### 4.6.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within 0.25 mile around developed administrative and/or recreation sites.

**For the purpose of:** Protecting the public's investment and/or the opportunity for a quality recreation experience.

**Justification:** Oil and gas development is not compatible with developed administrative sites and developed recreation sites. The purpose of this stipulation is to maintain a the quality work environment of administrative sites and the recreation setting associated with developed recreation sites on the SJNF and TRFO lands. Most of these sites currently have a predominantly natural environment soundscape. The industrial effects of oil and gas development, including facilities and noise are typically inconsistent with an administrative work environment or high quality recreation setting.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions to this stipulation may be authorized if site specific analysis indicates that drilling and operations can occur within ½ mile of the sites while still protecting the work environment of administrative sites and recreation safety and experience desired of recreation sites.

*Modifications:* A modification may be required if the site is expanded.

**Waivers:** This stipulation may be waived if the administrative or developed recreation site has been decommissioned.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 4.6.2 Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: Surface use or occupancy within one mile of developed administrative and recreation sites would be prohibited unless or until the operator submits an operating plan to the Authorized Officer that includes special design, construction, and implementation measures (including the relocation of operations by more than 650 feet) that describes how impacts to developed administrative and recreation sites would be prevented or minimized.

On the lands described below: Within one mile around developed administrative and recreation sites.

**For the purpose of:** Protecting administrative sites and the desired recreation setting prescriptions and scenic resource objectives and the recreation benefits within established recreation sites.

Justification: Administrative and/or recreation sites are where workers and the public have a high concern for the quality of the setting and/or the recreation experience, and where, active resource management is allowed but mitigated to limit the effect to the scenic and recreation setting. Often resource management actions other than for recreation are highly controversial, so this CSU requires the lessee to plan and mitigation their actions before surface disturbing actives take place. Therefore, a CSU is a tool to encourage active site specific design on projects which addresses the desired conditions identified in the Plan for all aspects of the recreation opportunity spectrum (ROS) within one mile of these sites.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface disturbing activity would not cause adverse impacts or would have negligible impacts to the developed administrative or recreation sites that the stipulation was designated to protect.

*Modification:* A modification may be granted if the site is expanded.

**Waivers:** This stipulation may be waived if the administrative or developed recreation site has been decommissioned.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 4.7 Special Recreation Management Areas

#### 4.7.1 Controlled Surface Use

**Surface occupancy or use is subject to the following special operating constraints:** Surface use or occupancy would be conditioned to minimize the impact to recreation settings within TRFO Special Recreation Management Areas (SRMAs).

**On the lands described below:** Within the boundaries of the SRMAs as identified in the LRMP and Appendix E.

For the purpose of: Meeting the desired recreation setting prescriptions and scenic resource objectives within established areas.

**Justification:** This stipulation is to assure that adequate site selection and planning, design, and mitigation is applied on a site-specific basis within SRMA landscapes. SRMAs are landscapes where people have a high concern for the quality of the recreation experience and settings, and scenic values. Often resource management actions other than for recreation are highly controversial; therefore, CSU is a tool to encourage active site specific-design on oil and gas projects, which addresses the desired conditions identified in the LRMP.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception if the plan of operation adequately mitigates impacts to recreation setting and experience within the SRMA

**Modification:** The boundary of the stipulated areas may be modified by the Authorized Officer if the extent of the SRMA is changed based on a programmatic recreation activity plan, an area recreation management plan, or a scenic inventory and assessment.

Waivers: A waiver would be considered if the area is no longer managed as an SRMA.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 4.8 National Scenic Byways; All American Roads and Backcountry Byways; Designated Scenic, Recreation, and Historic Trails; and Scenic Corridors

#### 4.8.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Within the identified foreground viewshed, up to 0.5 mile on either side of the following: San Juan Skyway, Trail of the Ancients, the Alpine Loop Back Country Byway, Continental Divide Trail, Colorado Trail, Calico Trail, Highline Loop Trail, East Fork Road, West Fork Road, First Notch Road, Piedra Road, Poison Park Road, Lime Creek Road, South Mineral Road, La Plata Canyon Road, West Dolores Road, and Durango-Silverton Narrow Gauge Railroad.

**For the purpose of:** Preserving and protecting the scenic integrity of designated national byways; scenic, historic, or recreation trails; popular scenic drives, and their recreation setting including the scenic character of the landscapes through which the roads and trails pass.

**Justification:** The purpose of this stipulation is to protect the integrity of viewsheds in scenic and cultural landscapes along significant, special routes, and popular scenic drives. Typically these foreground viewsheds are the most sensitive in terms of visitor expectations for high-quality scenery and an environment that is compatible with the special route designation. The visible evidence of oil and gas development is inconsistent with the maintenance of high scenic integrity in the foreground of these trails. Development associated with fluid minerals development is not a valued cultural element in the viewshed.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception to this stipulation if the operator's plan of operations demonstrates impacts from the Proposed Action can be mitigated or would be negligible to the recreation, scenic, and historic values.

**Modification:** The boundary of a stipulated area may be modified to match any boundary change made to any of the above listed areas

Waivers: This stipulation may be waived if the road, trail, or corridor is found not to exist within the lease area

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 4.9 High Scenic Integrity Objective and Visual Resource Management Class II Areas\*

#### 4.9.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Foreground areas with a high scenic integrity objective or Visual Resource Management (VRM) Class II. (Note: very high scenic integrity objective and VRM Class I are all within wilderness, recommended wilderness, and wilderness study areas and are therefore not available for lease.)

For the purpose of: Protecting the scenic values of these areas.

**Justification:** These are the areas where viewers have an expectation for high scenic integrity within the foreground viewshed, and where the landscape is to be managed for an overall high scenic integrity objective. Oil and gas exploration and production is typically incompatible with the maintenance of a high scenic integrity and generally inconsistent with protection of valued cultural viewsheds. Oil and gas development introduces industrial facilities and ground disturbance which contrast with natural features.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted if the Authorized Officer determines the impacts from the proposed oil and gas development can be mitigated to meet high scenic integrity objective or VRM Class II criteria.

Modification: Modifications may be considered.

Waivers: Waivers may be considered.

#### 5. AREA SPECIFIC STIPULATIONS AND NOTICES

#### 5.1 San Juan National Forest Colorado Roadless Areas

#### 5.1.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Areas mapped as Colorado Roadless Areas.

For the purpose of: To maintain roadless values and character.

**Justification:** Road building is generally necessary for oil and gas development and by intent these areas are to remain roadless and undeveloped to maintain their roadless character.

On NFS lands, the following exceptions, modifications, and waivers apply:

Exceptions: No circumstances have been identified under which an exception would be allowed.

*Modifications:* A modification may be granted if boundaries of the roadless areas have been modified.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 5.2 Lands Managed for their Wilderness Characteristics

## 5.2.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Areas mapped as lands managed for their wilderness characteristics on TRFO lands.

For the purpose of: To maintain the wilderness values and character.

**Justification:** Road building is generally necessary for oil and gas development and road building is not allowed in lands with wilderness characteristics, where the intent is to protect undeveloped and wilderness characteristics of the area.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** No circumstances have been identified under which an exception would be allowed.

**Modifications:** A modification may be granted if boundaries of the lands managed for wilderness characteristics has been modified.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

## 5.3 Dolores River Canyon

#### 5.3.1 No Surface Occupancy

No surface occupancy or use is allowed on the lands described below: Area as mapped for the Dolores River Canyon special area.

**For the purpose of:** Protecting the natural character, recreation, and scenic values of the canyon, and for protecting the rare plants, rare animals, and unique ecosystems that occur there.

**Justification:** Oil and gas development is not compatible with the resource and special values of this unique canyon, including proposed WSR status, important cultural sites, outstanding scenery, recreation experience, rare plants and animals, and rare plant communities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the resources identified in the Dolores River Canyon special area description.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### 5.4 Wild and Scenic Rivers

#### 5.4.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Lands within 0.25 mile from the centerline of either side of suitable scenic segments of scenic river segments. (Note: wild segments of suitable WSR are not available for lease.)

For the purpose of: Protecting WSR characteristics of suitable streams and rivers.

**Justification**: Stream segments found suitable for WSR designation must be managed in such a way as to protect their outstandingly remarkable river related values. Physical intrusions into a suitable scenic corridor would negatively affect the corridor and its suitability for designation. The 0.25-mile corridor is the same as the WSR analysis corridor, as recommended in FSM 1909.12, Chapter 80, and BLM guidance.

Interim management is directed in FSM19.09.12 as follows: "Leases, licenses, and permits under mineral leasing laws are subject to conditions necessary to protect the values of the river corridor in the event it is subsequently included in the National System." NSO is necessary to protect the scenery, recreation, wildlife, fish, cultural, and/or ecological values that make the river suitable for inclusion in the National Wild and Scenic Rivers System.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions to this stipulation may be authorized for recreation and scenic segments of WSRs if site-specific analysis and mitigation within the 0.25-mile corridor reveals a specific location to

allow drilling and infrastructure to occur without impacting that section of the river segment's suitability without impacting any of the outstandingly remarkable values of the suitable river segment. No exceptions would be allowed in wild river segments.

*Modifications:* The 0.25-mile boundary may be modified in accordance with the WSR plan.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## 5.5 Spring Creek Wild Horse Herd Management Area

#### 5.5.1 Lease Notice

Well pads within the Spring Creek Wild Horse Herd Management Area would be required to be fenced with horse-proof fencing (chain link, pipe, etc.) for safety and to keep the horses away from equipment, during development, production, and reclamation of mineral development. Additionally, operators would be required to install and maintain fences and locked gates on roads to production facilities in order to limit access in the Spring Creek Wild Horse Management Area to authorized vehicle travel only (e.g., using heavy pipe gates with fencing or boulders, etc., that restrict vehicles from going around gate). Cattleguards must be horse-safe and approved by BLM for placement and type.

#### 5.5.2 Timing Limitation

Activities are not allowed during the following time period: April 1 to July 31.

On the lands described below: Spring Creek Basin Herd Management Area.

For the purpose of: Protecting wild horse foaling.

**Justification:** To minimize stress to horses during the foaling period. Disturbance (such as vehicle use) must be infrequent and of low impact in order to achieve desired conditions and management objectives within the herd management area.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted if the activity would not stress the horses during foaling season.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

#### 5.5.3 Controlled Surface Use

**No surface occupancy or use is allowed on the lands described below:** Within a 2,000-foot radius around the mapped water sources in the Spring Creek Basin Herd Management Area, including the approximately 15 earthen reservoirs, undeveloped springs, and one water catchment.

For the purpose of: Preventing disruption to horses when seeking water and protecting quality of water source.

**Justification:** Water sources serve as concentration points for competing bands of wild horses. While the bands normally do not go to a water source at the same time, disruption of a water source via traffic, equipment or other disturbance would cause the horses behavior patterns to change, increasing the likelihood of inter-band competition as they have less time at the water source. This in turn may cause bands with the weaker stallion to abandon the water source or would cause increased fighting between bands.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted if the operator develops and maintains a viable alternative water source that would serve the same area as an impacted (≤ 2,000 feet from disturbance) existing horse water source.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 5.6 San Juan National Forest Management Area 1 – Natural Processes Dominate

## 5.6.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Areas designated as Management Area 1 – Natural Processes Dominate, excluding designated wilderness, or lands recommended for wilderness (which are not available for lease).

For the purpose of: Protecting the natural, unaltered landscape values and ecological integrity of these areas.

**Justification:** Management Area 1 outside designated wilderness is important as part of the vision of the SJNF undeveloped areas. Leasing within these undeveloped areas, while maintaining the natural characteristics of the area requires an NSO stipulation. While it is conceivable that exploration and development of oil and gas can take place without a road system there would still be ancillary development, such as drilling platforms, and should the well go into production there would be facilities to move product from the wellhead to collection facilities either by pipeline or trucking. Any of these development scenarios would degrade the naturalness of the area. There are no administrative restrictions or mitigation that would both protect the resource and allow for development.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

Exceptions: No circumstances have been identified under which an exception would be allowed.

**Modifications:** This stipulation may be modified if the management area one allocation or boundaries are changed through a land use plan amendment.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# 5.7 Developed Downhill Ski Areas (including Management Area 8 on San Juan National Forest lands)

#### 5.7.1 No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within developed downhill ski areas on SJNF and TRFO lands, currently including Durango Mountain Resort permit area, the Silverton ski area and expansion areas.

For the purpose of: Preventing user conflicts and incompatible uses (of which oil and gas development is included) in areas of high recreational value, scenery and significant recreational activity.

Justification: Oil and gas development is incompatible with the emphasized use of these areas.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would not cause adverse impacts or would have negligible impacts to the recreation use or scenery.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

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# Appendix I Vulnerable Watersheds

#### **VULNERABLE WATERSHEDS**

# San Juan National Forest Watersheds with the Highest Levels of Anthropogenic Disturbance

These watersheds on the San Juan National Forest (SJNF) have the greatest amount of anthropogenic disturbance and have the highest potential for impacts to aquatic, riparian, and wetland resources due to the high percentage of anthropogenic activities. The potential effects for all anthropogenic activities were analyzed by cumulating the percentile ranking for each of the identified anthropogenic activities. A total of six different activity categories was used for this process using all the activities: transportation, water use, vegetation management, urbanization, mineral extraction, and recreation. The values of 1 through 5 were assigned based on the percentile in which that Hydrologic Unit Code (HUC) watershed was located for the anthropogenic activity, with 5 being the highest percentile of impact. The watersheds in the following table were listed in Quantile 5 for all anthropogenic activities, which correspond to the 100th to 80th percentile range for percentage of watershed area affected by anthropogenic disturbances (Winters, Staley et al. 2006). These watersheds may be good candidates for remediation. The watersheds in Quantiles 1 through 4 can be found in the Aquatic, Riparian, and Wetland Ecosystem Assessment for the San Juan National Forest (Winters, Cooper et al. 2006, Winters, Staley et al. 2006).

Table I.1: Watersheds on the San Juan National Forest with the Highest Levels of Anthropogenic Disturbance

o <u>isturbance</u>									
HUC 6	HUC 6 Name	Recreation	Urbanization	Minerals	Transportation	Vegetation	Water Use	Total	Cluster*
140801070103	Chicken Creek	3	4	3	5	5	3	23	4r
140300020209	Upper Dolores River-Taylor Creek	4	2	3	5	4	5	23	5r
140801011601	Upper Beaver Creek	2	3	5	3	5	5	23	5r
140801020401	Martinez Creek-Dutton Creek	5	3	1	4	4	5	22	5r
140801010403	Fourmile Creek	3	2	3	4	4	5	21	2r
140300020105	Lower West Dolores River	2	3	3	3	5	5	21	5r
140801050106	Upper Cherry Creek	2	5	3	5	3	3	21	5r
140801040502	Elbert Creek	3	3	3	5	4	3	21	5r
140300020303	Upper Lost Canyon	4	2	1	4	5	4	20	2r
140801070102	West Mancos River	1	3	2	5	5	3	19	2r
140801010402	Laughlin Park	3	2	3	3	3	5	19	5r
140300020402	Beaver Creek-Trail Canyon	1	3	4	4	4	3	19	4r
140300020307	House Creek	1	2	3	5	5	3	19	4r
140300020604	Dolores Canyon-Lake Canyon	3	2	3	3	4	4	19	4r
140801010404	Upper Pagosa Springs	2	4	3	3	4	3	19	4r
140801010606	Navajo River-Weisel Flat	5	2	3	3	3	3	19	4r
140801010607	Coyote Creek	2	2	3	4	4	4	19	4r
140801011404	Vallecito Reservoir	5	2	1	3	4	4	19	5r
140801020301	Upper Devil Creek	4	2	1	4	5	3	19	5r
140801020501	Yellow Jacket Creek	2	3	3	3	4	4	19	4r
140801070105	East Fork of Mud Creek	1	5	5	3	2	3	19	4r
140801011302	Middle Beaver Creek	2	3	4	3	4	3	19	5r
140801040203	Lower Cascade Creek	5	2	2	4	4	2	19	2r

<sup>\*</sup>Clusters are defined in the narratives following the table.

Cluster 2r: The watersheds in cluster 2r are characterized by a high-elevation snowfall-driven hydroclimatic regime. The streams are underlain by rock units derived from mainly non-igneous formative processes. This cluster is dominated by high-gradient streams with a snowmelt regime that produces moderate to high yields of both coarse and fine sediment. Anthropogenic influences could have large influences on low-gradient reaches if excessive sediment were produced. Sediment produced in this cluster could influence stream reaches downstream. Watersheds in this cluster occupy the majority of the highest-elevation watersheds in the San Juan Mountains. Cluster 2r is among the most sensitive to changes in the thermal regime. Watersheds in this cluster are relatively unresponsive to changes in sediment regime resulting from the overall dominance of high-gradient stream channels.

Cluster 4r: The watersheds in cluster 4r are driven by a predominantly mixed precipitation hydroclimatic regime. The largely high-gradient streams in this cluster are typically underlain by non-calcareous lithology of a non-igneous origin. This cluster is dominated by high-gradient streams with a mixed snowmelt and rainfall flow regime that produces moderate to high yields of both coarse and fine sediment. The rain- and snow-driven conditions would produce a significant amount of sediment if exposed during periods of increased runoff. Cluster 4r watersheds are mainly at mid-elevations. A mixture of stream gradients is present. Cluster 4r is somewhat sensitive to changes in the thermal regime. Anthropogenic disturbance that increases sediment production would be detrimental to fish populations and riparian communities.

**Cluster 5r:** The watersheds in cluster 5r are driven by a predominantly mixed precipitation regime. The largely high-gradient streams in this cluster are typically underlain by lithology of a non-igneous origin. This cluster is dominated by high- and mid-gradient streams with a mixed snowmelt and rainfall regime that produces moderate to high yields of both coarse and fine sediment. Because of the heterogeneity of conditions within this cluster more site-specific analysis would be necessary to determine potential for sediment movement from management activities. Cluster 5r is somewhat sensitive to changes in the thermal regime. Additional sediment would be temporarily stored during low-flow conditions, degrading the biotic condition (Winters, Cooper et al. 2006).

# San Juan National Forest Watersheds Most Sensitive to Anthropogenic Disturbances

The sensitivity of a stream to human-caused disturbance is determined by the physical characteristics of the stream and its watershed. Table I-2 below summarizes watersheds that are naturally sensitive to disturbance (Winters, Cooper et al. 2006). Management activities planned within these watersheds may need additional design features that would minimize erosion potential and also minimize changes to stream flow regime and sediment load.

Most streams on the SJNF are high-gradient streams and consequently are assigned the lowest sensitivity to changes in water and sediment delivery. The channel bed and banks of these stream segments are composed of very coarse sediment that is less likely to experience a substantial change in mobility as a result of either a decrease or increase in water supply. These reaches also usually pass excess sediment downstream fairly efficiently and are less likely to have channel erosion than lower-gradient stream segments.

Low-gradient streams are typically assigned the highest sensitivity to changes in water and sediment yield. The materials forming the channel bed and banks in these stream segments are likely to be the most mobile of all the gradient categories and thus most likely to be eroded in response to increased flow or reduced sediment load. Eroded materials can be deposited in response to reduced flow or increased sediment load

The watersheds that were determined to be the most sensitive to anthropogenic disturbance typically occur at low to mid-elevations in mixed rain-snow precipitation regimes or rainfall-dominated regimes. These watersheds have been labeled 4r and 6r. Only watersheds with more than 20% of their area within the SJNF were included in the table.

**4r Watersheds:** These watersheds occur mainly at mid-elevations. A mixture of stream gradients is present although they contain mostly high-gradient streams. These watersheds are typically underlain by non-calcareous lithology of a non-igneous origin. The 4r watersheds are driven by mixed rain and snow precipitation regimes. The mixed snowmelt and rainfall flow regimes produce moderate to high yields of both coarse and fine sediment. These precipitation conditions would produce a significant amount of sediment if anthropogenic disturbances were to occur during periods of increased runoff. Activities that trigger sediment production would be detrimental to the fish populations and riparian communities in these watersheds.

**6r Watersheds:** The majority of these watersheds are driven primarily by rainfall hydroclimatic regimes with mixed rain and snow precipitation regimes. The streams in this cluster are underlain by rock units formed by predominantly non-igneous processes. These watersheds are dominated by erosive parent material that produce moderate to high yields of both coarse and fine sediment. These watersheds are also influenced dramatically by sediment produced upstream in other watersheds. Sediment deposition could influence stream-bank stability and over-wide channels where deposition occurs. Braiding of the stream channel could be realized in low-gradient channels where deposition occurs from upstream. This cluster is also sensitive to anthropogenic activities that alter the surface and subsurface hydrology.

Table I.2: Watersheds on the San Juan National Forest Most Sensitive to Anthropogenic Disturbances

HUC 6	HUC 6 Name	Cluster
140300020301	Spruce Water Canyon	4r
140300020304	Middle Lost Canyon	4r
140300020306	Upper Dolores River-Italian Creek	4r
140300020307	House Creek	4r
140300020308	McPhee Reservoir-Dolores River	4r
140300020402	Beaver Creek-Trail Canyon	4r
140300020406	McPhee Reservoir-Beaver Creek Inlet	4r
140300020506	Brumley Valley	6r
140300020507	Dawson Draw	4r
140300020509	Pine Arroyo	4r
140300020511	Disappointment Valley-Wild Horse Reservoir	6r
140300020601	Dolores River-Salter Canyon	4r
140300020602	Narraguinnep Canyon Natural Area	4r
140300020603	Dolores Canyon-Cabin Creek	4r
140300020604	Dolores Canyon-Lake Canyon	4r
140801010304	Middle Rio Blanco	4r
140801010306	Lower Rio Blanco-San Juan River	4r
140801010404	Upper Pagosa Springs	4r
140801010406	Mill Creek	4r
140801010606	Navajo River-Weisel Flat	4r
140801010607	Coyote Creek	4r
140801010701	Montezuma Creek	4r
140801010702	San Juan River-Trujillo	6r
140801011503	Ute Creek	6r
140801011504	Upper Spring Creek	6r
140801020302	Lower Devil Creek	6r
140801020404	Middle Stollsteimer Creek	6r
140801020405	Lower Stollsteimer Creek	6r
140801020501	Yellowjacket Creek	4r
140801020502	Piedra River-Stollsteimer	6r
140801020503	Piedra River-Navajo Reservoir Inlet	6r
140801070103	Chicken Creek	4r

# San Juan National Forest and Tres Rios Field Office Watersheds with Potential Salinity Issues

The watersheds in Table I-3 have a high potential for salinity issues since more than 50% of the watershed contains marine-derived Mancos or Lewis Shale, or the watershed was identified for salinity control potential in the Colorado River Basin Salinity Control Act of 1974. Information about cluster types as determined by the USFS Aquatic, Riparian and Wetland Ecosystem Assessment (Winters, Cooper et al. 2006) was available only for watersheds on lands administered by the SJNF. It should be noted that in addition to a high potential for salinity issues, Upper Cherry Creek also has a high amount of anthropogenic disturbance at this time.

Table I.3: Watersheds on the San Juan National Forest and Tres Rios Field Office with Potential Salinity Issues

HUC 6	HUC 6 Name	Watershed Size (acres)	Shale Soils (acres)	Shale Soils (% of watershed)	Shale Soils under BLM Management (acres)	Shale Soils under USFS Management (acres)	Cluster
	Upper Beaver Creek - McPhee	29,386	22,978	78	0	1,991	5r
140300020405	Lower Plateau Creek	20,507	13,350	65	419	3,081	5r
140300020501	Bear Creek-Disappointment Creek*	10,583	9,226	87	287	0	5r
	Disappointment Creek Headwaters*	17,516	14,830	85	776	3,157	5r
140300020503	Sheep Camp Valley*	12,004	8,019	67	5,620	238	5r
	Ryman Creek*	15,909	15,441	97	579	11,605	5r
140300020505	Upper Disappointment Creek*	26,058	19,138	73	8,996	7,291	5r
140300020506	Brumley Valley*	22,809	11,430	50	5,834	4,989	_
140300020507	Dawson Draw*	17,689	394	2	0	329	4r
140300020508	Spring Creek*	33,864	18,365	54	15,261	0	_
140300020510	Upper Disappointment Valley*	11,826	4,356	37	2,513	76	5r
140300020511	Disappointment Valley- Wild Horse Reservoir*	10,384	709	7	706	0	6r
140300020512	Middle Disappointment Valley*	12,705	5,946	47	4,106	0	_
	Lower Disappointment Valley*	18,851	9,057	48	6,132	0	_
140300030401	Naturita Creek*	56,142	34,747	62	290	732	5r
	Broad Canyon*	13,692	749	5	286	0	_
	Nelson Creek*	19,587	14,099	72	4,492	0	_
	Beards Corner*	10,247	7,802	76	3,046	0	_
140300030503		29,441	3,269	11	1,144	0	_
140300030504	11 2	38,598	22,124	57	9,700	0	_
140801010404	11 5 1 5	13,634	8,677	64	0	4,480	4r
	McCabe Creek	12,826	11,244	88	0	1,832	5r
140801010406		14,815	8,716	59	0	3,946	4r
140801010407	Echo Canyon Reservoir	14,521	9,633	66	0	984	5r

HUC 6	HUC 6 Name	Watershed Size (acres)	Shale Soils (acres)	Shale Soils (% of watershed)	Shale Soils under BLM Management (acres)	Shale Soils under USFS Management (acres)	Cluster
140801010408	e e	25,486	16,031	63	27	3,385	5r
	Mesa						
140801010605		10,265	8,991	88	29	0	_
140801011402	Bear Creek	12,371	7,017	57	0	4,055	
140801020104		16,480	9,278	56	0	4,205	5r
140801020401	Martinez Creek-Dutton Creek	18,021	12,178	68	0	5,303	5r
140801020404	Middle Stollsteimer Creek	14,230	7,778	55	0	5,460	_
140801050106	Upper Cherry Creek	24,793	12,853	52	88	4,956	5r
140801070106		10,804	9,342	86	1,612	0	_
140801070108	Mancos River-East Rim	15,063	10,213	68	2,078	0	_
140802020101	Simon Draw*	21,731	3,431	16	34	0	_
140802020102	Stinking Springs Canyon*	27,004	15,885	59	5,801	0	_
140802020104	McElmo Creek-Highline Ditch*	18,153	9,725	54	2,262	0	_
140802020105	Lower Alkali Canyon- Narraguinnep Canyon*	23,804	3,737	16	0	29	6r
140802020201	Upper Yellowjacket Canyon*	13,935	399	3	0	90	4r
140802020301	Mud Creek-McElmo Creek*	22,462	8,701	39	703	0	_

Selection Criteria for Watersheds: >25 acres of BLM and/or USFS lands with Lewis or Mancos Shale and either rated high for salinity control potential in the Colorado River Basin Salinity Control Act of 1974 or >50% of the watershed is Lewis and/or Mancos Shale.

#### References

Winters, D., D. Cooper, N. Lee, N. Poff, F. Rahel, D. Staley, and E. Wohl. 2006. Aquatic, Riparian and Wetland Ecosystem Assessment for the San Juan National Forest. Report 1 of 3: Introduction and Ecological Driver Analysis. Denver: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region

Winters, D., D. Staley, J. Fryxell, and J. Krezelok, 2006. Aquatic, Riparian and Wetland Ecosystem Assessment for the San Juan National Forest. Report 3 of 3: Ecological Driver Analysis and Anthropogenic Influence Results: Synthesis and Discussion. Denver: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region.

<sup>\*</sup> Watersheds that are rated high for salinity control potential in the Colorado River Basin Salinity Control Act of 1974.

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# **Appendix J**

# Biological Assessment for the Final San Juan National Forest Land and Resource Management Plan

# Biological Assessment for the Final San Juan National Forest Land and Resource Management Plan

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## **CHAPTER 1 – INTRODUCTION**

This Biological Assessment (BA) analyzes the potential effects of the proposed 2013 revision of the Land and Resource Management Plan (LRMP) for the U.S. Forest Service (USFS) San Juan National Forest (SJNF) and Bureau of Land Management (BLM) Tres Rios Field Office (TRFO) on threatened, endangered, and proposed wildlife, invertebrate, and plant species, as well as proposed critical habitat. Section 7(a)(2) of the Endangered Species Act (ESA) states that each federal agency, in consultation with the Secretary of the Interior or Secretary of Commerce, must ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Section 7(c) of the ESA requires preparation of a BA if listed species or critical habitat may be present in a project area to assess whether the Proposed Action may affect a listed species or its critical habitat. This BA is prepared in accordance with the legal requirements set forth under Section 7(c) of the ESA, and USFS manual direction to address potential effects to listed species from proposed activities.

# 1.1 Decisions to be Made Under the Revised Land and Resource Management Plan

The LRMP for which we are consulting provides strategic guidance for future management of National Forest System (NFS) lands managed by the SJNF. The LRMP guides the restoration or maintenance of the health of SJNF lands using an ecosystem management approach that provides for the conservation of all wildlife and plant species. The LRMP also promotes a sustainable flow of uses, benefits, products, services, and visitor opportunities. The LRMP provides a framework for decision-making, and guides resource management programs, practices, uses, and projects. It does not include specific project and activity decisions. Those decisions are made later, after more detailed analysis and further public involvement.

Four alternatives have been developed for management of the SJNF. Each is a management strategy that in different ways emphasizes an ecosystem management approach to species conservation. Alternative B, which is detailed below, is our Proposed Action (Preferred Alternative).

Alternative B provides for a mix of multiple-use activities, with a primary emphasis on maintaining most of the large, contiguous blocks of undeveloped lands, enhancing various forms of recreation opportunities, and maintaining the full diversity of uses and active forest and rangeland vegetation management. Alternative B focuses on balancing the goals of maintaining "working forest and rangelands" and of retaining "core, undeveloped lands." Uses and activities that require roads, such as timber harvesting and oil and gas development, would be mostly focused in areas that are already roaded. Relatively undeveloped areas and areas that are unroaded would, for the most part, remain that way.

The alternatives not selected are:

- Alternative A, which represents the continuation of current management direction under the
  existing 1983 San Juan National Forest Land and Resource Management Plan. The
  alternative reflects the implementation of existing management goals, objectives, and
  management practices based on the existing land use plan.
- Alternative C, which provides for a mix of multiple-use activities with a primary emphasis on
  maintaining the undeveloped character of the planning area. Production of goods from
  vegetation management would continue, but might be secondary to other non-commodity
  objectives. Alternative C identifies more resources and areas for special designation than the
  other alternatives. Management provisions under this alternative would emphasize the
  undeveloped character of large blocks of contiguous land and non-motorized recreational
  activities to a greater degree than would any of the other alternatives.
- Alternative D, which provides for a mix of multiple-use activities, with a primary emphasis on the "working forest and rangelands" concept in order to produce a higher level of commodity goods and services when compared to the other alternatives.

There are two related but different decisions for which we are consulting; each will have a separate Record of Decision:

- Adopting a revised LRMP for the SJNF. The new LRMP replaces the current LRMP adopted in September 1983.
- Determining the NFS lands that would be administratively available for oil and gas leasing, as
  well as the associated leasing stipulations. The USFS considers leasing availability decisions
  to be separate from, but closely linked to, planning decisions, with both planning- and projectlevel components. NFS lands in the planning area are currently managed for leasing under
  the analysis and decision for the 1983 San Juan National Forest Land and Resource
  Management Plan. Under the LRMP, 1,367,769 acres were open for leasing, mostly under
  standard lease terms. Approximately 95,500 acres are currently leased.

The lands analyzed in the Final Environmental Impact Statement (FEIS) encompass the approximately 1,867,800 acres of the SJNF, administered by the USFS. The planning area is located in Archuleta, Conejos, Dolores, Hinsdale, La Plata, Mineral, Montezuma, San Juan, and San Miguel Counties, Colorado.

#### The Tiered Decision-Making Process: Resource Commitments

The LRMP revision is part of a two level decision-making framework. The FEIS, from which the BA is developed, examines potential environmental impacts that could occur as a result of land use allocations and the implementation of actions associated with final planning decisions. Potential subsequent projects and/or activities are discussed in the FEIS in order to analyze the differences between the alternatives. These projects and activities are actions that could occur, but are not authorized or approved by the LRMP, and would need to be analyzed through subsequent project-level environmental analysis. The LRMP Record of Decision will not approve or execute project-level activities.

The oil and gas availability decisions follow the same path as other activities. After the oil and gas leasing availability decision is made for NFS lands, the USFS may authorize the BLM to lease specific lands. Subsequent lease nominations submitted to the BLM by industry would be subject to verification that leasing has been adequately addressed in a separate National Environmental Policy Act (NEPA) analysis and is consistent with the LRMP, assurance that conditions of surface occupancy identified in the leasing availability decision are properly included as stipulations in resulting leases, and determination that operations and development could be allowed somewhere on each proposed lease, except where stipulations prohibit all surface occupancy.

Ground-disturbing activities, such as drilling exploratory wells, would require further NEPA analysis when an application for permit to drill (APD) is received. Proposals to develop a well field would also require site-specific NEPA analysis before being approved. However, this BA treats the leasing decision component of the revised LRMP as if it is an irreversible and irretrievable commitment of resources and therefore analyzes the effects of oil and gas development similar to that which would occur for a project-level analysis.

## The Nine Key Land and Resource Management Plan Decisions

The proposed LRMP contains the following key components and decisions that comprise the SJNF's management system. Each of these decisions may affect threatened, endangered, and candidate species either beneficially or negatively, and provide projected outcomes which are the basis for this consultation:

- The establishment of management area (MA) direction, allowable uses, allocations, restrictions, and prohibitions (36 Code of Federal Regulations [CFR] 219.11).
- The establishment of desired outcomes, including multiple-use goals and objectives. Goals
  are expressed as desired condition in the form of aspirations for which our MA direction,
  objectives, standards, and guidelines have been directed (36 CFR 219.11(b)).
- The establishment of management requirements, including measures or criteria that would be applied in order to guide day-to-day activities. These are primarily expressed as standards

and guidelines in the Preferred Alternative (resource integration requirements of 36 CFR 219.13–219.16).

- The designation of research natural areas (RNAs) and other special designations.
- The recommendations of lands for inclusion in the National Wilderness Preservation System.
- The identification of river segments that are suitable for inclusion in the National Wild and Scenic Rivers System.
- The designation of suitable timber lands and the establishment of allowable sale quantity (36 CFR 219.14).
- The designation of suitable grazing lands.
- The establishment of monitoring and evaluation requirements (36 CFR 219.11(d)).

#### Oil and Gas Leasing

In addition to the key LRMP decisions listed above, this BA also addresses the decision to make certain lands available or unavailable for oil and gas leasing. This leasing decision is not an LRMP decision and will be issued under a separate Record of Decision. However, the analysis for this decision is combined with the analysis of the LRMP decisions in the FEIS and in this BA.

## 1.2 Forest Planning Consultation History

The current SJNF LRMP was approved in 1983. The associated 1983 BA concluded that there would be no adverse effect to the species consulted on from the LRMP's implementation. The U.S. Fish and Wildlife Service (USFWS) concurred with this determination on May 20, 1983, at which time both agencies agreed that site-specific analysis of projects on a case-by-case basis would be a primary mechanism for meeting responsibilities under Section 7 of the ESA.

Subsequently, a major amendment of the LRMP was implemented in 1992. Through programmatic evaluation of that action, a "No Effect" determination was reached. The USFWS concurred with this determination on April 11, 1991. Site-specific analysis and ESA Section 7 consultation on a case-by-case basis, as needed, was reiterated as the primary mechanism for evaluating potential effects on federally listed species.

This action constitutes a revision of the 1983 LRMP, as amended in 1992.

# 1.3 The Land and Resource Management Plan

# Overarching Land and Resource Management Plan Direction – Species Conservation

A new management plan has been developed for the SJNF (the Proposed Action). With this LRMP, there is direction that implements a systematic approach to the management of biological diversity and species conservation on the SJNF. As a basis, the management of wildlife on the SJNF is guided by laws, regulations, and policies that prescribe management requirements for the public lands. USFS regulation under 36 CFR 219.19 requires that "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." Regulation 36 CFR 219.26 requires that forest planning provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area. Such diversity would be considered throughout the planning process.

To address these requirements, the LRMP's sustainable ecosystems strategy would provide the ecological framework for the conservation and management of ecosystems, habitats, and species occurring on the SJNF. The sustainable ecosystems strategy includes a four-pronged approach that frames wildlife, fish, and plant species program direction on the SJNF and TRFO. This approach includes 1) the designation and management of protected areas, which include SJNF wilderness areas, the Piedra Area, Colorado Roadless Areas (CRAs), and RNAs; 2) the application of ecosystem management using sustainable ecosystem concepts; 3) the development and application of the LRMP components

presented below (desired conditions, objectives, standards, and guidelines) that provide a framework for the management and preservation of ecosystems; 4) the monitoring of effects of management activities on the SJNF and TRFO; and 5) the application of adaptive management principles in response to monitoring results. Effective monitoring and evaluation of how SJNF management activities are affecting ecosystems and wildlife, and the application of adaptive management principles, would be critical to maintaining functional, sustainable ecosystems and addressing the needs of dependent species. Refer to Section 4.0 of the LRMP for a review of the monitoring requirements.

Protected areas are lands that we have dedicated to the protection and maintenance of biological diversity. Within this BA, protected areas are used in context of the LRMP and have no specific relationship to listed species as may be found within some recovery plans. The definition of protected areas is found within Appendix J.A. These areas would serve as conservation reserves and refuges to protect the native biodiversity within them and provide wildlife movement corridors and linkage areas that connect landscapes and habitats, which facilitates the interaction of animals. Establishing and preserving protected areas on the SJNF is a means to maintain ecosystem diversity. Protected areas are established to ensure ongoing species diversity and maintain the population viability of native plant and animal species and communities. Approximately 566,053 acres of the SJNF is within CRAs and would be managed according to the direction of the Colorado Roadless Rule. Protected areas comprise 54% of the SJNF; 153,194 of those acres are within more restrictive Upper Tier CRAs. While CRAs do allow for some activities, these areas more or less are undeveloped, where management activity is limited and in overall serve as refuges that provide for wildlife movement and relatively undisturbed habitat.

Ecosystem management is the integrating component of the sustainable ecosystems strategy. Ecosystem management on the SJNF, which uses the historical range of variability (HRV) for reference, would be implemented by maintaining or restoring the composition (plant species, animal species, and vegetation types), structure (size, density, and arrangement of live and dead vegetation; stream channel attributes), function (ecological processes and disturbances), and physical environment (soils, water, and geomorphology) of ecosystems. The approach is intended to protect and maintain these ecosystems and ensure the diversity and population viability of the majority of species within them.

Wildlife species that may not be adequately recognized or protected by the above ecosystems management approach, or whose specific habitat needs or other life requirements may not be fully met under the sustainable ecosystems strategy, are given special management considerations, including the development of LRMP components that contribute to the conservation of those species. In addition, current species-specific conservation plans and strategies would be relied upon to address the needs of special status species. These plans and strategies are discussed within the applicable resource sections of the LRMP. These plans and strategies are analogous to the Nature Conservancy's (TNC) fine-filter approach, which is intended to protect species with known conservation concerns (Hunter et al. 1988; Noss 1987; TNC 1982).

Overall, the LRMP provides management direction that is intended to provide for species diversity and population viability goals described above. The process has been to identify a range of key ecosystem elements, determine the importance of those elements to maintaining species diversity and population viability (e.g., limiting factors), define desired future conditions and land management objectives for those elements, and ensure that appropriate management standards and guidelines are in place that address the ecological needs of species and populations. In general, management standards are provided for those elements determined to have an overriding influence on species diversity or long-term population viability, while other elements that have less influence are addressed through the application of management guidelines. Existing and updated guidance is not repeated within the LRMP but is referenced within the Other Referenced Guidance sections for each resource area within the LRMP. The relevant standards and guidelines, along with desired conditions and management objectives, and leasing stipulations, are listed in Appendix J.B.

#### **Standards**

A standard is an approach or condition that has been determined to be necessary to meet desired future conditions and objectives, and/or to ensure the long-term viability of resources. A standard (worded as

"must" or "shall") describes a course of action that must be followed or a level of attainment that must be reached. Deviations from standards would require analysis and documentation through a subsequent land management plan amendment.

#### Guidelines

A guideline (worded as "should") is a requirement that we have established to meet desired future conditions and objectives, and/or to ensure the long-term viability of resources. Guidelines are put forward in the LRMP in recognition that there may be circumstances that could generate or require alternative, more appropriate means for meeting desired future conditions and objectives, and/or to ensure the long-term viability of resources. It is also recognized that there may be limited individual circumstances where the need for a guideline no longer exists or the applicability of a guideline is otherwise altered (e.g., changes is surrounding land use that may render a guideline ineffective). In these situations, a guideline has been determined to be more appropriate than a standard by allowing some flexibility in approach as conditions change and new information is obtained.

#### Other Referenced Guidance

The LRMP also uses appropriate components that address specific needs of federal listed species. This includes direction found in recovery plans, adoption of guidance such as that found within the Southern Rockies Lynx Amendment (SRLA), and new information and direction as agreed to in consultation with the USFWS. Appropriate agency manuals, handbooks, laws, regulation, policy, memoranda of agreement (MOUs), etc., are listed in this section for each resource area.

## 1.4 Management Area Allocations

The MA prescriptions, which represent the allocation of SJNF lands to various emphases, have been assigned to land areas of the on the SJNF (Table J.1)

Table J.1: Management Area Allocations on San Juan National Forest Lands

Management Area Allocations	Preferred Alternative
	(acres)
MA 1 - These are areas of the SJNF where natural processes would dominate and determine the	598,517
vegetative characteristics of wildlife habitats. These areas include the Weminuche, Lizard Head	
and South San Juan wildernesses, the Piedra Area, and other undeveloped area identified for	
limited management, including the west half of the Hermosa roadless area, the San Miguel	
roadless area, and areas adjacent to existing wilderness.	
MA 2 - These are areas of the SJNF that would be managed as special areas and designations.	91,985
These areas include RNAs, botanical areas, and archaeological areas.	
MA 3 - These are areas of the SJNF that would be managed as natural landscapes with limited	596,119
management. They are relatively unaltered lands and places where natural ecological processes	
would operate primarily free from human influences. Succession, fire, insects, disease, floods,	
and other natural processes and disturbance events would predominantly shape the composition,	
structure, and landscape patterns of wildlife habitats	
MA 4 - High-use recreation emphasis areas: These areas are places with relatively high levels of	69,864
recreation use that would be managed in order to provide for a broad spectrum of visitors. They	
include popular recreation destinations such as lakes and campgrounds, and travel corridors	
valued for their scenery, including scenic byways.	
MA 5 - Areas designated as active Management: These areas include roaded areas where active	451,730
management would continue to occur in order to meet a variety of social, economic, and	
ecological objectives. These are lands where timber harvesting, oil and gas activities, and	
intensive livestock grazing would continue to occur and influence the composition, structure, and	
landscape patterns of the vegetation.	

Management Area Allocations	Preferred Alternative (acres)
MA 7 - Public and private lands intermix: These areas are places where the SJNF is in close proximity to private lands. These areas would be a priority for fuels and vegetation treatments in order to reduce wildfire hazards. Winter range for deer and elk is a common component of MA 7 areas, as are seasonal closures in order to reduce animal disturbance.	49,560
MA 8 - highly developed areas: These areas include downhill ski areas and the McPhee dam on SJNF lands.	7,056
Total Acres	1,864,831

The management area allocations provide for managing approximately 1.3 million acres as unroaded with limited activities and to function as core habitat areas. These protected areas are lands that would be dedicated to the protection and maintenance of biological diversity. They would serve as conservation reserves and refuges to protect the native biodiversity within them and would provide wildlife movement corridors and linkage areas that connect landscapes and habitats, which facilitates the interaction of animals.

## 1.5 Land Suitability and Program Objectives Decisions

## Lands Suitable For Livestock Grazing and Projected Stocking

These two LRMP decisions (suitability and objectives) designate where livestock grazing would occur on the SJNF and the objectives for livestock grazing as defined by projected stocking levels (Table J.2). Lands where grazing has been found unsuitable include areas with high soils hazard, low forage production potential, closed canopy spruce, and currently closed allotments, and others. Suitable lands are lands that have been determined to have adequate productivity that are not eliminated by the preceding factors. Table J.2 does not include suitable acres outside active allotments, such as in forage reserve or vacant allotments.

Table J.2: Suitable Grazing Lands and Stocking Rates

Livestock Grazing	Proposed Action (Preferred Alternative)
Animal Unit Months (AUMs)	(11ciciicu Aiteinative)
Sheep: permitted AUMs	6,396
Cattle: permitted AUMs	105,809
Livestock Grazing Suitable and Available acres	
Sheep: suitable areas on active allotments	76,921
Cattle: suitable areas on active allotments	666,160

## Lands Suitable for Timber Production and Timber Management Objectives

Lands suitable for timber production are lands where we have determined timber production is compatible with desired conditions and objectives (Table J.3). These lands are in MA 5 areas where timber harvests would occur on a regulated, scheduled basis. The land characteristics are generally lands outside roadless areas, on slopes less than 40%, capable of producing greater than 20 cubic feet per acre per year. These lands were available in the previous management plans.

Table J.3: Timberlands Suitable for Production and Allowable Sales Quantity

able 3.3. Timberianus Suitable 101 Trouuction and Anowable Sales Quantity		
Suitable Timberlands and Timber Production	Proposed Action	
Suitable for timber production - SJNF (acres)	311,583	
Other tentatively suitable lands where non-commercial timber harvest may occur -		
SJNF (acres)	361,282	
Total Acres where Timber Harvesting May Occur on the SJNF	672,865	
Allowable sale quantity (million cubic feet/million board feet)	4.0/19.9	

Suitable Timberlands and Timber Production	Proposed Action
Ponderosa pine acres treated	1000 Rest.
	500 PC
Warm-dry mixed conifer acres treated	250 Rest.
	250 PC
Cool-moist mixed conifer acres treated	125 PC
Aspen acres treated	500 CC
Spruce-fir acres treated	100 PC

Rest = Restoration, a form of partial cut where post-harvest residual density is partially or closely tied to HRV. PC = Partial cut; includes single-tree and group selection, improvement cuts, shelterwood, and other partial-cut harvesting methods, generally removing 30% or less of the existing overstory.

CC = Clearcut; Coppice.

Under the LRMP, the majority of timber harvesting would be used to meet desired vegetative conditions including improvements in age-class distribution, reduction of hazardous fuels, and improvements in stand structure or composition designed to return forest vegetation to desired conditions. The SJNF may be managed in order to reduce the intensity and extent of disturbances (e.g., wildfire or insect epidemics) that otherwise might result in damage to ecosystem processes and functions. Management activities may also be used to maintain forested vegetation at a desired point within the HRV in order to avoid broad swings in various elements that have occurred naturally over time, but are undesired today. To best meet these goals, commercial and non-commercial timber harvest would be concentrated in the lower-elevation forested vegetation types.

## Lands Suitable for Motorized and Non-motorized Recreation

Motorized *suitable* areas designated in the LRMP have existing developed road and/or motorized trail systems that, for the most part, serve current recreation and resource access needs for a particular area. The road and motorized trail system in motorized suitable areas would generally not be considered for expansion or substantial alteration of the transportation system. Importantly, the Proposed Action eliminates over-ground cross-country motorized use, and as such no over-ground cross-country acreages are included in Table J.4. Table J.4 only displays suitability of lands for over-ground and over-snow travel, it does not authorize or make any decisions or changes to the over-ground or over-snow system. This does not affect or change conditions as consulted on concerning snow compaction for lynx habitat.

Table J.4: Recreation Suitability and Objectives

SJNF Motorized Travel Over Ground (acres)	
Not suitable	928,054
Suitable areas	936,778
Total	1,864,832
Motorized Travel Over Snow (acres)	
Not suitable areas	1,072,520
Suitable areas	792,312
Total	1,864,832

The areas identified as *unsuitable* for over-ground or over-snow travel have boundaries similar to MA 1, which are wilderness areas or other areas where natural processes dominate. The areas identified as *suitable* for over-ground travel or *suitable* for over-snow travel have boundaries that correspond to MA 3 (natural landscapes with limited management), MA 4 (high use recreation emphasis), MA 5 (active management), MA 7 (public and private land intermix) and MA 8 (highly developed). On NFS lands, large tracts of non-motorized areas, such as roadless areas are classified as unsuitable.

## Oil and Gas Availability Decision and Projected Development

As compared to the current LRMP, the Proposed Action has more lands stipulated No Surface Occupancy (NSO), Controlled Surface Use (CSU), and Timing Limitation (TL), to protect sensitive

biological and physical resources. Designated wilderness areas and the Piedra Area are withdrawn from leasing by law. Approximately 67,700 acres are recommended for wilderness and Wild and Scenic River (WSR) designation (wild river segments) and are administratively not available for lease. Roadless areas are stipulated NSO. For lands outside of roadless areas, a full range of stipulations are assigned, including NSO stipulations, and for lands outside roadless areas, a full range of leasing stipulations are assigned including NSO, TL, CSU, and standard lease terms to protect various resources such as highly erosive soils, steep slopes, critical wildlife habitat, and areas with special management designations such as archaeological areas (Table J.5).

Table J.5: Oil and Gas Leasing Availability

SJNF	Proposed Action (acres)
Federal mineral acres	1,863,402
Acres withdrawn from leasing	509,954
Acres administratively not available for leasing	73,636
Acres available for leasing	1,279,811
NSO	876,266
TL	882,532
CSU	527,489
Standard lease terms	143,722

Prospective oil and gas development areas include the Paradox Basin portion of the SJNF, the northern San Juan Basin (existing leases), and the San Juan Sag.

Table J.6 tabulates the cumulative number of wells, miles of well access roads, and acres of projected development of existing and future leases. Northern San Jun Basin development at 80-acre spacing would involve expansion of existing well pads only. A certain percentage of wells drilled do not produce product or enough to be economically viable. The table projects the number of wells that would be non-producing. These non-producing wells and any infrastructure associated with them are required to be reclaimed to a natural state.

Table J.6: Proposed Action: Projection of Well Pads and Access Road Miles, and Corresponding Disturbance Acres on National Forest Lands, 2013–2027

Acres on National Forest Lands, 2013–2027						
	Existing	<b>Existing Well Sites</b>	Projected We		Projected We	
	Producing	Projected to be	Existing 1		Future I	
	Wells	Reclaimed (2011–	Non-productive	Production	Non-productive	Production
		2027)	(reclaimed)	(long-term)	(reclaimed)	(long-term)
Northern San				_		_
Juan Basin –	32	0	0	255	0	0
CBM						
Northern San						
Juan Basin –	0	0	30	0	0	0
conventional						
San Juan Sag	0	0	5	0	25	0
Conventional	0	0	2	6	14	93
gas	U	<u> </u>				
- Gothic Shale	0	0	8	59	42	279
Total	32	0	45	320	81	372
	Existing	<b>Existing Road Miles</b>	Projected Roa		Projected Roa	
	Road	Projected to be	Projected We		Projected We	
	Miles	Reclaimed (2011–	Existing 1		Future I	
		2027)	Non-productive	Production	Non-productive	Production
			(reclaimed)	(long-term)	(reclaimed)	(long-term)
Northern San						
Juan Basin –						
CBM	16	0	0	70	0	0
Northern San						
Juan Basin –						
conventional	0	0	0	0	0	0
San Juan Sag	0	0	2	0	12	0
Conventional						
gas	0	0	1	3	7	46
Gothic Shale	0	0	4	36	21	140
Total	16	0	7	109	40	186
	Evictin	g Wells and Roads	Projected Di		Projected Di	
		<u> </u>	Existing 1		Future I	
	Total	Total Acres Projected	Non-productive	Total Acres	Non-productive	Total Acres
	Acres	to be Reclaimed	Wells and	Disturbed –	Wells and	Disturbed –
	Disturbed		Associated	Production	Associated	Production
			Roads	Wells and	Roads	Wells and
			(reclaimed)	Roads	(reclaimed)	Roads
Northern San						
Juan Basin -	110	0	0	585	0	0
CBM						
Northern San						
Juan Basin –	0	0	15	0	0	0
conventional						
San Juan Sag	0	0	20	0	100	0
Conventional	0	0	10	25	5.5	270
gas	0	0	10	25	55	370
Gothic Shale	0	0	60	435	320	2120
<b>Total Acres</b>	110	0	105	1045	475	2490

Only roads for administrative use (closed to public) are included. Pipelines are projected to be in road rights-of-way, so road disturbance acres include pipeline disturbance.

CBM = coalbed methane.

## Water Consumption Resulting from Drilling, Completion, and Well Operations

Substantial quantities of water are projected to be used to drill, fracture, and complete wells for both Gothic Shale Gas Play (GSGP) and conventional well development (see Appendix J.C). GSGP wells would use approximately 7.9 to 13.1 acre-feet of water per well for the entire process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a coalbed methane gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per wells to drill and complete. In the Northern San Juan Basin, coalbed methane (CBM) wells would be drilled on existing leases, but doubling the number of wells on each well pad. In total, 126 federal wells are projected. Water consumption to drill, complete, and operate the wells over their 20-year economic life is 241 acre-feet. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives (Table J.7).

Table J.7: Projected Water Used to Develop Conventional and Gothic Shale Wells, Coalbed Methane Development, and Conventional Wells within the San Juan Basin for the Proposed Action

Area	Water Usage (acre-feet)
Dolores Basin - Leased and unleased GSGP and Paradox conventional	4,831
San Juan Basin - Leased and unleased GSGP and Paradox conventional	201
Northern San Juan Basin new 80-acre infill development	241
San Juan Sag (San Juan Basin) - new lease development	35
Total	5,308

## Fire and Fuels Management Decisions

Under the revised LRMP, the SJNF would use prescribed burns and mechanical treatments to achieve multiple objectives, including hazardous and natural fuels reduction, wildlife habitat improvement, ecosystem restoration, and range betterment. Approximately 8,500 to 10,500 acres of hazardous fuels would be treated annually, primarily through prescribed burning. Mechanical treatments would constitute approximately 30% of the overall fuels program. For the SJNF, much of the focus on reducing fire risk is on the wildland urban interface (WUI) areas where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. These areas often are within MA 7 areas. The focus of the treatment program would be vegetative treatments in the lower-elevation vegetation types. Management of naturally ignited wildfire for resource benefit would be the preferred management approach for the higher-elevation forest types. Wildland fire would be used in order to maintain public land conditions within the HRV while, at the same time, recognizing that other resource and social values may determine the appropriate management responses. Use of managed fire, along with mechanical and other fuels management strategies, may create forest conditions that meet desired conditions for the natural vegetation types within the planning area.

Table J.8: Acres of Fuels Treatments (annual)

Table 5.8. Acres of Fuels Treatments (annual)			
Vegetation Type	Treatment	Proposed Action (annual)	
Pinyon-juniper	Mastication and Prescribed Fire	1,000 acres	
Mixed shouldend/ne nine	Mastication	2,000 acres	
Mixed shrubland/no pine	Prescribed fire	1,000 acres	
Oakbrush understory in pine	Mastication	2,500 acres	
Dondaraga nina	Mastication & Mechanical	1,500 acres Restoration Treatment	
Ponderosa pine	Prescribed fire	3,500 acres	
Warm dry mixed conifer	Mechanical	500 acres Restoration Treatment	
Warm-dry mixed conifer	Prescribed fire	1,000 acres	
Mixed vegetation types	Fire managed for resource benefit	1-50,000 acres	
Spruce-fir	Fire managed for resource benefit	1-50,000 acres	

## Special Uses

The SJNF administers approximately 700 non-recreational land use authorizations consisting of special use permits, rights-of-way (ROW) grants, easements, and leases that authorize the occupancy and use of public lands by government agencies, private individuals, or companies for a variety of activities (including roads, dams, pipelines, and other private or commercial uses). The SJNF special uses program also authorizes the occupancy of public lands for pipelines, communication lines, power transmission lines, and communication sites. The new LRMP brings forth the current procedural management requirements, but because MAs change, there would be a change in terms of where developments are allowable and discouraged.

There is a difference in terms of how the Proposed Action conditions and ultimately manage new and existing authorizations. New authorizations would be subject to all of the requirements of the new LRMP. They would be also be conditioned by MA direction, which can be more restrictive in MAs 1, 2 and 3. Some new special use applications may not be compatible with these three MAs and may be rejected; other applications may have valid existing rights, which, as a result, may afford the USFS less discretion to reject outright an application not compatible with MA direction. Existing authorizations are not subject to immediate retroactive application of LRMP requirements. However, upon expiration and application for reauthorization, they must be adjusted to conform to current LRMP requirements.

For the purposes of impact analysis, future special use authorizations cannot be predicted as to specific location, scale, and timing; therefore, there is no clear way to estimate the impacts of a special uses program under the requirements of the Proposed Action. However, overlaying MAs with threatened and endangered species habitat provides a rough indication of areas where species protection would be highest. Given the assumption that MAs 1, 2, and 3 are more restrictive (especially where these MAs correlate with special designations such as Colorado Roadless Areas, etc.) they are most favorable to threatened and endangered species. Conversely, MA 5 and 7 areas are less restrictive and would be more compatible with special uses development. Ultimately, the degree of the impacts of any project would depend on approved conservation strategies, critical habitat designations, and Biological Opinions (BOs) that mandate specific management requirements for land uses. These requirements would not be known until specific project proposals are submitted and assessed.

## Habitat Improvement Objectives

The Proposed Action has annual wildlife habitat improvement, fish habitat improvement, and watershed restoration objectives, including erosion control, stream restoration, riparian/lake/fen treatments, and road decommissioning. In addition, the objectives for vegetation management, including timber harvest and the fire program objectives, have direction for wildlife habitat improvement by creating conditions guided by HRV desired outcomes. Table J.9 lists objectives for habitat improvement. The acres for accomplishment are mostly accomplished through other resource programs other than with wildlife program budget. Resource areas such as timber would design timber accomplishment, as listed in Table J.3, to achieve habitat improvement goals as listed below. Thus, the acres listed below are also captured as the same accomplishment for the timber program listed in Table J.3, not in addition to the acres listed in that table.

Table J.9: Watershed, Riparian, and Aquatic and Terrestrial Habitat Improvement

Estimated Resource and Program Management Activities	Proposed Action
Water and Habitat Improvement Projects	
Watershed road densities reduced – road decommissioning	3 miles
Fish habitat enhanced or improved	6 miles
Wildlife Habitat Improvement Projects	
Terrestrial wildlife habitat improvement and restoration	2,000 acres
Ponderosa pine restoration to support associated wildlife populations	3,000 acres
Cool-moist mixed conifer and spruce-fir restoration to support associated wildlife	2,000 acres
populations	
Winter range habitat improvement for big game	5,000 acres

Estimated Resource and Program Management Activities	Proposed Action
Aspen restoration to support associated wildlife populations	3,000 acres
Invasive plant acres treated	1,500 acres/year

## CHAPTER 2 – ENVIRONMENTAL BASELINE

The environmental baseline used for this BA is the existing environmental condition, which includes the past and present impacts of all federal, state, and private actions and other activities occurring within the action area; the anticipated impacts of all proposed federal projects within the action area that have already undergone formal Section 7 consultation; and the impact of state or private actions occurring during the same period of time as the consultation process. It should be noted that the environmental baseline that would be applied to certain analyses related to LRMP implementation may differ from that used for ESA consultation purposes.

## 2.1 Species Considered and Species Evaluated

Tables J.10, J.11 and J.12 list the wildlife, invertebrate, fish, and plant species that are being evaluated. The USFWS approved this species list on December 21, 2012. These species fall under the requirements of Section 7 of the ESA [16 United States Code [USC] 1531 et seq.], which outlines the procedures for federal interagency cooperation designed to conserve federally listed species and designated critical habitats. Since list concurrence, the North American wolverine (*Gulo gulo luscus*) has been designated as proposed threatened, and the Gunnison sage-grouse (*Centrocercus minimus*) has been designated as proposed endangered with proposed critical habitat. In addition, the yellow-billed cuckoo (*Coccyzus americanus*) is a federal candidate species and is analyzed in the LRMP FEIS Biological Evaluation.

**Table J.10: Threatened and Endangered Wildlife Species** 

Species Species	Federal Listing Category	Primary Habitat Association	General Habitat and Status on the SJNF
Canada lynx (Lynx canadensis)	Threatened	Spruce-fir	Primarily inhabits high-elevation spruce-fir forests; also cool-moist mixed conifer, high-elevation aspen mixed with spruce or cool-moist mixed conifer, and willow-riparian adjacent to the above habitats. Closely associated with snowshoe hare ( <i>Lepus americanus</i> ) as a primary prey item. The SJNF is considered part of the core habitat for the state lynx reintroduction program.
Gunnison sage-grouse (Centrocercus minimus)	Proposed Endangered	Sagebrush	Lower-elevation contiguous landscapes of varied sagebrush habitats.
Mexican spotted owl (Strix occidentalis lucida)	Threatened	Pinyon- juniper/ mixed conifer	Mixed conifer or ponderosa pine/mixed conifer located in steep rock-walled canyons. Individuals have been documented on the SJNF; no documented reproduction to date.
North American wolverine (Gulo gulo luscus)  Proposed Threatened		Spruce-fir and alpine	Primarily inhabits high-elevation spruce-fir forests; also cool-moist mixed conifer, high-elevation aspen mixed with spruce or cool-moist mixed conifer, and willow-riparian adjacent to the above habitats.
Southwestern willow flycatcher (Empidonax traillii extimus)	Threatened	Riparian/ Wetland	Willow-riparian patches of at least $30 \times 30 \times 5$ feet tall and at least 0.25 acre or larger. Individuals have been documented on the SJNF; no documented reproduction to date.
Uncompangre fritillary butterfly (Boloria acrocnema)	Endangered	Alpine	Alpine habitat above 12,500 feet with a snow willow ( <i>Salix nivalis</i> ) component. Sites are generally found on north, northeast, and east aspects and represent the coolest microclimates in high alpine cirques. One small population is known to occur on the SJNF.

We are consulting on five fish species, the bonytail chub (*Gila elegans*), humpback chub (*G. cypha*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and lineage greenback cutthroat trout (*Oncorhynchus clarki stomias*) (see Table J.11). The first four species are found downstream of the planning area in mainstem reaches of the San Juan, Dolores, and Colorado Rivers. The greenback cutthroat trout is found in Stoner Creek, Little Taylor Creek, Rio Lado Creek, and Roaring Forks Creek, all of which are tributaries of the Dolores River System.

Table J.11: Threatened and Endangered Fish Species

Species	Status	Known to Occur on SJNF lands	General Habitat	
Bonytail chub	Endangered	No	Large warm water rivers	
(Gila elegans)				
Colorado pikeminnow	Endangered	No	Large warm water rivers	
(Ptychocheilus lucius)				
Humpback chub	Endangered	No	Large warm water rivers	
(Gila cypha)				
Razorback sucker	Endangered	No	Large warm water rivers	
(Xyrauchen texanus)				
Lineage greenback cutthroat trout	Threatened	Yes	Cold water rivers and	
(Oncorhynchus clarki stomias)			streams	

Table J.12: Threatened and Endangered Plant Species

Species	Status	Habitat Description	Known to Occur on SJNF Lands
Knowlton's cactus (Pediocactus knowltonii)	E	Rolling, gravelly hills in pinyon-juniper/sagebrush communities at about 6,200 to 6,300 feet elevation. Strongly associated with pea- to cobble-sized gravels (tertiary alluvial deposits of the San Jose Formation) covering a majority of the soil, black sagebrush ( <i>Artemisia nova</i> ), and occurrence of reindeer lichen ( <i>Hypogymnia physodes</i> var. <i>vittata</i> ).	No
Pagosa skyrocket (Ipomopsis polyantha)	E	Found on barren shale, montane grasslands, ponderosa pine, juniper/Gambel oak plant communities on the Mancos Shale Formation At elevations of 6,750–7,775 feet, but possible between 6,400 and 8,100 feet.	No
*E=Endangered	•		

On February 4, 2013, the USFWS published a proposed rule to list the distinct population segment (DPS) of the North American wolverine occurring in the contiguous United States as a threatened species under the ESA (USFWS 2013a). The DPS evaluation in the proposed rule concerns the segment of the wolverine species occurring within the contiguous 48 states, including the northern and southern Rocky Mountains, Sierra Nevada Range, and North Cascades Range (USFWS 2013a). The proposed rule did not propose any critical habitat for the species.

There are numerous historical records of North American wolverines from the Colorado Rocky Mountains; however, the species is believed to have been extirpated from the southern Rocky Mountains in Colorado, New Mexico, and Wyoming by the early 1900s (Aubry et al. 2007 cited in USFWS 2013b). The lack of records for Colorado and Utah after 1921 suggests that the southern Rocky Mountains population of wolverines was extirpated in the early 1900s, concurrent with widespread systematic predator control by government agencies and livestock interests (USFWS 2013a).

The Preferred Alternative is not likely to jeopardize the continued existence of North American wolverine, as there is currently no wolverine population on the SJNF or State of Colorado, and the available scientific and commercial information does not indicate that other potential stressors such as land management, recreation, infrastructure development, and transportation corridors pose a threat to the

DPS (USFWS 2013a). Section 7 (a)(4) of the ESA requires conferencing with the USFWS when a Proposed Action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. Because the Proposed Action is not likely to jeopardize the continued existence of North American wolverine, conferencing is not required.

On January 11, 2013, the USFWS published a proposed rule to list the Gunnison sage-grouse as an endangered species under the ESA (USFWS 2013c). In addition, approximately 1,704,227 acres are being proposed for designation as critical habitat in Chaffee, Delta, Dolores, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Miguel Counties in Colorado, and in Grand and San Juan Counties in Utah (USFWS 2013d).

Gunnison sage-grouse currently occur in seven widely scattered and isolated populations in Colorado and Utah, occupying 3,795 square kilometers (1,511 square miles) (USFWS 2013c). The seven populations are Gunnison Basin, San Miguel Basin, Monticello–Dove Creek, Pinyon Mesa, Crawford, Cerro Summit–Cimarron–Sims Mesa, and Poncha Pass (USFWS 2013c). There are approximately 48 acres of proposed critical habitat on the SJNF in Dolores County. Based on the best available information, there are no Gunnison sage-grouse present on the proposed critical habitat location or on any other lands managed by the SJNF.

The proposed critical habitat for Gunnison sage-grouse on lands managed by the SJNF is considered very marginal given its fragmented nature from other habitat, lack of sagebrush (*Artemisia* sp.), and existing disturbances associated with use of an access road, adjacent gravel pit, and agricultural activities on adjacent private lands. The habitat is located on a mesa, surrounded by mostly non-habitat. Habitat is therefore isolated from other sage-grouse habitat, the closest being approximately 1 mile west. Sagebrush vegetation is sparse on the site, encompassing less than 25% of the vegetative species composition. The eastern portion of the site occurs on a steep slope with pinyon-juniper vegetation. There is an access road that runs through the middle of the site that accesses a gravel pit located on state lands on the northern end. And finally, there is irrigated farm land south and adjacent to the habitat. There are approximately 50 acres of potential habitat on adjacent private lands to the southwest.

The Preferred Alternative is not likely to jeopardize the continued existence of Gunnison sage-grouse or adversely modify proposed critical habitat on the SJNF. There are currently no sage-grouse present on the SJNF. The proposed critical habitat present on SJNF lands is isolated from other patches of sage-grouse habitat. At this time, there are no actions planned that would adversely modify proposed critical habitat. The LRMP contains management direction specific to sage-grouse to minimize adverse impacts from land management actions. Section 7 (a)(4) of the ESA requires conferencing with USFWS when a Proposed Action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. Because the Preferred Alternative is not likely to jeopardize the continued existence of Gunnison sage-grouse, or destroy or adversely modify proposed critical habitat, conferencing is not required. Section 7 consultation would be reinitiated with the USFWS for future activities that have potential to effect sage-grouse and proposed critical habitat.

# 2.2 Assessment of Threatened and Endangered Terrestrial Wildlife Species and Invertebrates

## **Consultation History**

The following is a list of SJNF-level Section 7 consultations that have occurred on the SJNF related to the Proposed Action.

- Biological Opinion for the Southern Rockies Lynx Amendment, ES/CO: USFS/SRLA, TAILS: 65412-2008-F-00370, BO ES/LK-6-CO-08-F-024 (USFWS 2008).
- Supplemental Biological Assessment for the Southern Rockies Lynx Amendment (USFS 2008).
- Biological Opinion for the Management and Control of Noxious Plants on the San Juan and Rio Grande National Forests, ES/CO: SJ/RGPLC, TAILS 65413-2011-I-0136 (USFWS 2011a).

 Biological Assessment for the Management and Control of Noxious Plants on the San Juan and Rio Grande National Forests (USFS 2011).

## Canada Lynx (Lynx canadensis)

#### **Background**

The Canada lynx was listed as a federally threatened species under the ESA in March 2000. The species is also listed as endangered by the State of Colorado. Currently, there has been no federal recovery plan published for the species. In November 2006, the USFWS designated critical habitat for the contiguous United States DPS of the Canada lynx (USDA Forest Service and USFWS 2006). There was no critical habitat designated for the species in the southern Rockies (Colorado and southern Wyoming). These lands were not included due to the Conservation Agreement between the USFS and USFWS (USFS 2005a) and an agreement by the USFS to incorporate conservation measures in the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000). The Recovery Outline (USFWS 2005) identifies core areas, secondary areas and peripheral areas, based on historical and current occurrence records, as well as confirmed breeding. The southern Rockies were identified as a Provisional Core Area. This designation was identified because this area contains a reintroduced population, which has documented reproduction in the recent past.

Canada lynx habitat on NFS lands in Region 2 is managed in accordance with the SRLA (USFS 2008). The SRLA amended eight Forest Plans in Region 2 that are within the Southern Rocky Mountains Geographic Area (SRMGA). The San Juan Mountains and SJNF lie at the southern end of the SRMGA. The SRLA contains management direction in the form of management objectives, standards, and guidelines that are intended to provide a consistent approach to conserve lynx and lynx habitat. Much of the management direction in the SRLA was based on management recommendations contained in the LCAS.

The following is a summary of the status and distribution, habitat requirements, and risk factors for Canada lynx in the southern Rocky Mountains and the SJNF. Much of the information was taken from the BA and BO for the SRLA (USFS 2008; USFWS 2008), the LCAS, and the Ecology and Conservation of Lynx in the United States (Ruggiero et al. 2000a), and monitoring reports by the Colorado Division of Wildlife, currently referred to as Colorado Parks and Wildlife (CPW) (Colorado Division of Wildlife 2009). More detailed information on the species life history, risk factors, and other pertinent biological information can be obtained in the documents mentioned above.

#### Status and Distribution

Most of the records and literature on Canada lynx abundance and distribution in the southern Rocky Mountains indicate that historically, populations were relatively rare, compared to populations in Alaska and the northern portions of Washington and Montana. Verified records after the 1920s are rare in southern Wyoming and in Colorado, with central Colorado being the "core" area of lynx records until the early 1970s. A statewide lynx verification program was conducted in Colorado from 1978 to 1980 and concluded that a viable but low-density lynx population persisted in Eagle, Pitkin, Lake, and Clear Creek Counties with evidence of lynx occurrence in Grand and Park Counties, Utah. Lack of evidence from other parts of lynx range in Colorado may have been due to lack of adequate surveys. Several surveys conducted since then have not confirmed lynx to be present. While the surveys did not cover the entire state, they were sufficient to conclude that lynx at that time were rare in the southern Rockies.

Even though lynx individuals appeared to persist in the southern Rocky Mountains, the population had not rebounded despite the removal of key suppressing factors such as commercial trapping and indiscriminate predator control. It was believed that the population was so small in Colorado that it was incapable of rebounding and was augmented with a re-establishment program by CPW in 1999. A total of 218 lynx was released in the San Juan Mountains from 1999 to 2006. The San Juan Mountains are part of the core research area, which is located from the New Mexico border, north to Gunnison, west to Taylor Mesa, and east to Monarch Pass. In 2010, CPW declared the reintroduction program a success when recruitment exceeded mortality.

The majority of surviving lynx from the reintroduction effort currently continue to use high-elevation (9,500 feet) forested terrain in an area bounded on the south by New Mexico north to Independence Pass, west as far as Taylor Mesa and east to Monarch Pass. Lynx continue to occupy suitable habitat in the core release area and other locations across Colorado. Most movements away from the core release area were to the north. Numerous travel corridors within Colorado have been used repeatedly by more than one lynx. These travel corridors include the Cochetopa Hills area for northerly movements, the Rio Grande Reservoir-Silverton-Lizardhead Pass for movements to the west, and southerly movements down the east side of Wolf Creek Pass to the Conejos River valley.

Within the areas of high use in southwest Colorado, site-scale habitat use, documented through snow tracking, supports mature Engelmann spruce-subalpine fir (*Picea engelmannii-Abies lasiocarpa*) forest stands with 42% to 65% canopy cover and 15% to 20% conifer understory cover as the most commonly used areas in southwest Colorado. Little difference in aspect (slight preference for north-facing slopes), slope, or elevation were detected for long beds, travel, and kill sites. Den sites, however, were located at higher elevations and more commonly north-facing slopes with a dense understory of coarse woody debris.

### Habitat in the Southern Rocky Mountains

Lynx habitat in the southern Rocky Mountains is usually found in the subalpine and upper montane forest zones, typically between 8,000 and 12,000 feet in elevation. Upper-elevation subalpine forests are dominated by subalpine fir and Engelmann spruce. As the subalpine zone transitions down to the upper montane, spruce-fir forests begin to give way to a predominance of lodgepole pine (*Pinus contorta*), aspen (*Populus tremulolides*), or mixed stands. Engelmann spruce and/or subalpine fir may retain dominance on cooler, more mesic mid-elevation sites, intermixed with aspen, lodgepole pine, and Douglas-fir (*Pseudotsuga menziesii*). White fir (*Abies concolor*) appears in the San Juan Mountains, Sangre de Cristo Range, and Wet Mountains in southern Colorado. The lower montane zone is dominated by ponderosa pine (*Pinus ponderosa*), pinyon-juniper communities, and Douglas-fir, with pine typically dominating on lower, drier, more exposed sites, and Douglas-fir occurring on moister and more sheltered sites. Although the lower montane zone is generally below occupied lynx habitat, montane forests can be important as connective travel habitat that may facilitate lynx dispersal and movements between blocks of lynx habitat, and may provide some foraging opportunities during those movements.

Lynx forage in forested stands with a high density of young, healthy trees or shrubs tall enough to protrude above the snow. These areas provide habitat for snowshoe hare (*Lepus americanus*) (primary prey), and may occur in early successional stands following disturbance (such as vegetation treatments, wind throw, and wildfire) or in older forests with a substantial understory of shrubs and young conifers. Willow riparian areas also provide year-round foraging habitat for hares. Denning habitat consists of midaged or mature and older forests with complex physical structure on the ground such as downed logs, trees, or rocks and boulders. Forested areas that lack complex physical structure on the ground provide little value for denning.

#### Habitat on the San Juan National Forest

Lynx habitat on the SJNF was modeled using habitat criteria in the LCAS and through coordination with USFWS. Updates to the SJNF lynx habitat model and Lynx Analysis Unit (LAU) boundaries were completed in December 2010 based on guidance provided by the USFWS. Modeled lynx habitat consists of spruce-fir, cool-moist mixed conifer, high-elevation aspen mixed with spruce-fir or cool-moist mixed conifer, and willow riparian adjacent to these habitats. Modeled habitat is based on existing vegetation and habitat attributes such as tree size and canopy closure within forested stands. Vegetation data and habitat attributes were obtained from the SJNF's geographic information system (GIS) vegetation database. LAUs represent planning units that approximate home ranges for female lynx. They provide a scale in which to evaluate and monitor the effects of management actions on lynx habitat over time (Ruediger et al. 2000). The remapping of lynx habitat also resulted in the re-delineation of LAUs to better meet the intent of LAUs representing the biological needs for lynx home ranges. Due to a better understanding of lynx habitat as it relates to the habitat criteria described within the SRLA and adjusted for local condition, and in consultation with the USFWS, acreages of lynx habitat across the SJNF have

changed. The initial mapping effort, prior to the SRLA identified 1,048,567 acres of lynx habitat on the SJNF. The current model identified 752,435 acres across the SJNF, Table J.13 describes existing lynx habitat and LAUs across the SJNF.

Table J.13: Existing Lynx Habitat on the San Juan National Forest

LAU Name	LAU	LAU	LAU	<b>Total Suitable</b>	Total	Total Lynx	Percent	Non
	Number	Gross	Net	Lynx Habitat	Stand	Habitat	Stand	Habitat
		Acres	NFS	(acres)	Initiation	(acres)	Initiation	(acres)
			Acres	, , ,	(acres)	, ,		, ,
Bear Creek	21,327	45,779	44,101	32,194	2,417	34,611	7%	9,491
Black Mesa	21,329	78,289	75,435	52,253	1,836	54,089	3.4%	21,346
East Dolores	21,328	47,347	46,135	35,020	1,314	36,334	3.6%	9,801
River								
East Fork San	21,318	72,906	67,926	44,593	72	44,665	0.2%	23,262
Juan River								
Engineer	21,331	89,976	84,796	39,552	3,149	42,701	7.4%	42,095
Fourmile-	21,336	45,897	42,555	19,518	5	19,523	0.0%	23,,032
Turkey								
Hermosa	21,304	80,080	79,042	61,016	917	61,934	1.5%	17,108
Junction	21,325	85,183	80,817	47,709	224	46,933	0.5%	33,884
Creek								
Lower Pine	21,333	60,821	58,286	40,310	2,353	42,663	5.5%	15,623
River								
Mancos	21,326	69,800	65,534	38,249	430	38,679	1.1%	26,855
Missionary-	21,324	66,434	60,494	33,383	4,311	37,694	11.4%	22,800
Florida								
Mosca-	21,334	42,720	42,700	29,819	1,839	31,659	5.8%	11,042
Coldwater								
Needles	21,308	62,601	62,245	25,864	997	26,861	3.7%	35,384
Piedra River	21,314	86,770	84,680	46,909	156	47,066	0.3%	37,614
Headwaters								
Rico	21,330	75,730	71,126	51,612	221	51,833	0.4%	19,293
Rio Blanco	21,321	81,221	75,500	48,750	87	48,837	0.2%	26,662
Upper Pine	21,335	37,450	37,450	20,441	0	20,442	0.0%	17,009
River								
Vallecito	21,311	61,935	60,287	26,319	4,029	30,348	13.3%	29,939
Creek								
Weminuche	21,332	44,291	41,090	27,503	8	27,510	0.0%	13,580
West Fork	21,316	57,011	53,032	32,356	176	32,533	0.5%	20,499
San Juan								
River								

Currently, there are approximately 752,435 acres of suitable lynx habitat and approximately 24,479 of unsuitable habitat (habitat in the stand initiation stage) across the SJNF. The vast majority of the primary lynx habitat is located in subalpine forests in designated wilderness (Lizard Head, Weminuche, and South San Juan) and other protected areas such as roadless areas. The SRLA also provided for land management activities that could occur under exceptions or exemptions to the SRLA guidance. The acres that could be affected under the exceptions and exemptions were capped at a percentage of lynx habitat across the landscape. These were initially based on mapped acreages from the first habitat model. These have been readjusted to reflect the current habitat model acreages for SJNF.

In 2006 the SJNF identified areas important for lynx movement and/or connectivity. Five linkage areas were identified including Wolf Creek Pass, North La Plata Mountains, Lizard Head Pass, Molas Pass – Coal Bank Pass, and Red Mountain – South Mineral (Schultz et al. 2006). The Wolf Creek Pass linkage area includes areas on both sides of U.S. Highway 160 east of Pagosa Spring and provides for north-

south movement. At the top of Wolf Creek Pass, it connects with the Rio Grande National Forest linkage area. Monitoring by CPW indicates that the area is being used by lynx. The primary concern in this linkage area is a high-volume, four-lane highway (U.S. Highway 160), which continues to receive periodic upgrades. Other concerns include old clearcut areas, as well as forest roads and meadows with concentrated snowmobile use and other winter recreation activity. Wolf Creek ski area is directly east of and next to this linkage area. There is proposal by a private owner to build a village adjacent to the ski area surrounded by NFS lands managed by the Rio Grande National Forest. The Wolf Creek Pass area likely provides the primary connectivity between the southern San Juan Mountains (South San Juan wilderness) and the central San Juan Mountains (Weminuche wilderness).

The North La Plata Mountains linkage area is centered on the ridgeline above Hermosa Creek, which connects the Lizard Head and Molas area to the La Plata peaks block of habitat. It incorporates the Divide Road (Forest Road 564) and the narrowest segment of spruce-fir habitat from north to south, which is fragmented both naturally and by past timber harvest activities. The primary concern in this linkage area is maintaining a narrow and relatively fragmented band of primary lynx habitat along a restricted ridgeline that is the only high-elevation connection into the La Plata Mountains. This linkage area probably provides the primary connectivity between the Rico Mountains and central San Juan Mountains to the north and the relatively isolated and disjunct La Plata Mountains to the south.

The Lizard Head Pass linkage area includes a rough triangle extending from Lizard Head Pass (U.S. Highway 145) to Rico to East Hermosa. It connects with the Uncompander National Forest linkage area at the top of Lizard Head Pass. Lynx movements have been documented throughout this linkage area. The primary concern is a high-speed, two-lane highway (U.S. Highway 145). Lynx habitat is disjunct near the crest of the pass (meadows), but safe crossing of the highway is important all along the linkage area. This linkage area includes private land south of U.S. Highway 145 that contains significant primary lynx habitat and is considered likely to be key to linkage integrity. This area provides linkage between disparate blocks of primary habitat, as well as movement within a known lynx high-use area.

The Molas Pass – Coal Bank Pass linkage area includes areas on both sides of U.S. Highway 550 from the north side of Molas Pass south to the south side of Coal Bank Pass, and south of Silverton (U.S. Highway 550). It extends north to the South Mineral portion of the Red Mountain Pass linkage and has a shared linkage boundary at Deadwood Gulch. Lynx habitat throughout the linkage area is naturally fragmented and patchy, due to high-relief topography, pre-settlement fires, and steep terrain. There is well-documented lynx use, however, throughout the area. The primary concern in this linkage area is for east-west crossing of a high-volume, two-lane highway (U.S. Highway 550), and crossing is important all along the linkage area. A lynx fatality near Durango Mountain Resort is evidence that the area is being used by lynx, and that highway crossing is a valid concern (Schultz et al. 2006). This area is an east-west connection between habitat blocks on both sides of the highway and between the West Needle Mountains and Rico Mountains and Ophir Mountains.

The Red Mountain – South Mineral linkage area includes both sides of U.S. Highway 550 from Silverton to the top of Red Mountain Pass, where it connects with the Uncompahgre National Forest linkage area. It includes the entire South Mineral Creek drainage from U.S. Highway 550 to the San Miguel County line. Lynx habitat throughout the linkage area is naturally fragmented and patchy, due to high elevation and steep terrain. There is well-documented lynx use, however, throughout much of the linkage area. The primary concern is east-west crossing of a high-volume, two-lane highway (U.S. Highway 550), and crossing is important all along the linkage area. The South Mineral drainage is included in this linkage area to provide a connection west toward the known lynx use areas of Trout Lake and Lizard Head Pass. The South Mineral drainage is also the most probable east-west connection between the Lizard Head Pass area to the west and the expansive central San Juan Mountains east of Silverton and farther east to Lake City.

There was very minimal alteration of lynx habitat over the last planning cycle (~30-year period). During this period, the primary impacts to habitat resulted from natural disturbances such as wildfire and, to a much larger extent, insects and disease. Spruce-fir forests have experienced widespread spruce bark beetle (*lps typographus*) activity, resulting in impacts to mature and late successional spruce-fir forests. Large areas of spruce mortality were noted in the early 2000s with activity spreading from the Wolf Creek

Pass area west to the upper Los Pinos River Drainage. Large stands of Engelmann spruce have either died or are dying due to the epidemic beetle infestation, causing major changes to forest structure. The resulting changes include the loss of the forest overstory in some areas with a corresponding increase in understory vegetation (grasses, forbs, and shrubs). These changes have and would continue to affect habitat for lynx and primary and alternate prey species.

A variety of recreational activities occur across lynx habitat on the SJNF. Potential effects to lynx from recreation management stem from the use of forest roads, developed recreation, non-winter dispersed recreation, and dispersed winter recreation. There are approximately 2,761 miles of forest roads (maintenance levels 1-5) across the SJNF, and approximately 1,041 miles occur of which in lynx habitat. Roads designated as open to motorized use receive varying degrees of use during summer. Many of the recreationists enjoy traveling on forest roads that provide access to high elevations because of the scenery present and the vast amount of outdoor activities available (day hiking, mountain biking, backpacking, horseback riding, and in some areas designated off-highway vehicle [OHV] use, etc.). During winter, the vast majority of forest roads are closed to motorized use, except for areas designated/approved for over-snow motorized use. Currently, approximately 321,269 acres of lynx habitat is suitable/available for winter motorized recreation. The SJNF has seen an increase in many forms of winter recreation (snowmobiling, snowshoeing, cross-country skiing, back-country skiing, hybrid skiing-use of snowmobiles to access downhill ski terrain, etc.). The SJNF also has numerous developed recreation facilities (campgrounds, visitor centers, day use areas, trailhead parking areas, etc.) that receive extensive use during summer, with some areas (trailhead parking areas) receiving extensive use during winter. These recreational activities have resulted in impacts to lynx habitat. The overall impact from all these activities to lynx is uncertain; however, cumulatively these activities have likely not resulted in appreciable adverse impacts to lynx due the vast amount of suitable habitat present across the SJNF and the vast amount of habitat available that receives limited to non-existent use by humans during summer and winter.

#### **Direct and Indirect Effects**

The SRLA BA and BO address key risk factors affecting lynx productivity, mortality, and movement in the southern Rocky Mountains. As noted in the BO, management actions that affect lynx productivity include vegetation management (timber harvest, fuels treatments, and salvage harvest), fire management, recreation management (forest roads, developed recreation, non-winter dispersed recreation, and winter dispersed recreation), minerals and energy, and livestock grazing. Management actions affecting mortality include trapping, competition and predation, predator control, and incidental or illegal shooting. Management actions affecting movement include highways and associated developments and private land development. This BA describes how the proposed management actions associated with the Preferred Alternative would affect key risk factors for lynx. The BA summarizes the direct and indirect effects from the proposed management actions and also tiers to the effects findings described in the SRLA BA and BO.

#### **Management Actions Affecting Lynx Productivity**

**Vegetation Management:** Under the Preferred Alternative, timber harvesting may occur across approximately 672,865 acres of the SJNF. These acreages include lands that are suitable for timber production and other tentatively suitable lands where non-commercial timber harvest may occur. Of the total, approximately 315,027 acres are lynx habitat and include approximately 9,620 acres of unsuitable habitat or habitat in the stand initiation stage.

Under the Preferred Alternative, approximately 675 acres of lynx habitat may be treated annually over the life of the LRMP (approximately 15-year period), which includes 125 acres of cool-moist mixed conifer, 500 acres of aspen, and 50 acres of spruce-fir. In total, approximately 10,125 acres of lynx habitat would be treated via timber management across the SJNF. Treatment methods in cool-moist mixed conifer and spruce-fir forests would include single tree and group selection, improvement cuts, shelterwood, and other partial-cut harvesting methods generally removing 30% or less of the existing overstory.

Timber outputs associated with the Proposed Action are expected to have minimal influences on lynx habitat because of the minor amount of acreage involved and application of SRLA management direction. As described in the SRLA BA and BO, some treatments may improve denning, dispersal, and foraging habitat, while others may have negative short-term impacts that render the habitat unsuitable on a temporary basis. Although no new road construction is expected, timber management activities may involve the reconstruction and re-opening of existing roads, which may cause additional disturbance and possibly result in increases in recreational activities such as snowmobiling. Additional road use may result in additional snow compaction, possibly increasing competition from coyotes and other competitors.

Vegetation treatments occurring across the SJNF would review objectives (VEG O1, O2, O3 and O4) and adhere to standards (VEG S1, S2, S5, and S6) and guidelines (VEG G1, G4, G5, G10, and G11) in the SRLA. With application of the SRLA objectives, standards, and guidelines, potential adverse effects to lynx from vegetation management projects are expected to be reduced. The SJNF would continue to report on the use of exemptions and exceptions to the SRLA vegetation management standards. The current baseline information for exemptions and exceptions are listed in Tables J.14 and J.15.

Table J.14: Wildland Urban Interface Fuels Treatment Exemptions Used in Lynx Habitat on the San Juan National Forest

Ī	Total Acres	Acres of	Acres of Lynx	Forest	<b>Current Forest</b>	Cumulative % Change
ı	of Lynx	Lynx Habitat	Habitat Treated	Allocation per	Balance (acres)	from SRLA ITS
ı	Habitat	Treated	under the WUI	SRLA		Allocation (D-E/Dx100)
	<b>Treated (fuels</b>	inside the	Exemption	Incidental		
ı	and non-fuels	WUI		Take		
ı	vegetation			Statement		
	treatments)			(acres)		
	254	0	0	23,307	23,307	0.0%

Table J.15: VEG S5 and S6 Exceptions Used in Lynx Habitat on the San Juan National Forest

Acres of	Forest	Current	Acres of	Forest	Current	Combined	Combined	Cumulative
Lynx	Acreage	Balance	Lynx	Acreage	Balance	Allocation	Current	% Change
Habitat	Allocation	of Forest	Habitat	Allocation	of Forest	per	Balance of	from
Treated	(0.5%)	Allocation	Treated	(1%) per	Allocation	Incidental	Forest	Combined
under	per SRLA	(0.5%)	Under	SRLA	(1%)	Take	Allocation	Incidental
Exceptions	Incidental	(acres)	Exception	Incidental	(Acres)	Statement	(1.5%)	Take
1–4 in	Take		5 in VEG	Take		(1.5%)	(C+F)	Statement
VEG S5	Statement		S5 (1% of	Statement		(B+E)		Allocation
and			lynx	(ITS)				(G-
Exceptions			habitat)	(1%)				H/Gx100)
1–3 in								
VEG S6								
(0.5% of								
lynx								
habitat)								
114	3,885	3,771	0	7,769	7,769	11,654	11,540	1.0%

Fuels treatments such as mechanical vegetation thinning are generally not associated with the cover types that comprise lynx habitat. These treatments would occur in Gambel oak (*Quercus gambelii*) shrublands, ponderosa pine, and warm-dry mixed conifer cover types.

**Fire Management:** Prescribed fire through application of ground or aerial ignition methods are generally not associated with the cover types that comprise lynx habitat. Prescribed fire would be applied in the same cover types as fuels treatments described previously.

Wildfires that result from natural ignitions (lightning) would be managed under the SJNF's wildland fire use program, where fires are managed for resource benefits. Under the Preferred Alternative, fires that are managed for resource benefits may occur on 1 to 60,000 acres annually. These fires are a primary means for restoring natural disturbance processes to high-elevation forest cover types and are likely to occur in lynx habitat.

The influence of wildland fire in lynx habitat could involve short- to long-term reductions in denning habitat due to the removal of dead and down woody material. Other effects include a temporary reduction in suitable snowshoe hare habitat. In most areas, wildland fire should promote the regeneration of snowshoe hare habitat over time. Despite the potential for large wildfire occurrence, large blocks of lynx habitat on the SJNF are expected to remain available. In general, wildland fire can be expected to have greater influences on snowshoe hare and lynx habitat suitability when fires burn at mixed intensity and severity across the landscape. In these cases, the influences on habitat suitability and prey species may last longer due to the presence of habitat attributes preferred by lynx and prey species. In most cases, long-term benefits to both prey and predator are expected from wildfire managed for resource benefits.

ESA Section 7 emergency consultation may be initiated with the USFWS where discretionary actions are taken that have effects on lynx or lynx habitat when managing fires caused by natural ignitions. In some instances the construction of line via hand or mechanical equipment may be necessary to help confine or contain the fire to pre-established management boundaries. Wildfire management conservation measures identified in the LCAS would be applied to reduce potential effects from discretionary actions.

**Recreation Management:** Potential effects to lynx from recreation management stem from the use of forest roads, developed recreation, non-winter dispersed recreation, and dispersed winter recreation.

Under the Preferred Alternative, there are approximately 936,778 acres suitable for motorized travel over ground. Of the total, approximately 792,313 acres provide suitable motorized travel over snow. The amount of lynx habitat present in suitable motorized areas is discussed below. Designated suitable motorized areas have existing developed road and/or motorized trail systems that, for the most part, serve current recreation and resource access needs for a particular area. The road and motorized trail system in motorized suitable areas would generally not be considered for expansion or substantial alteration of the transportation system. More importantly, the Preferred Alternative eliminates cross-country motorized use.

Under the Preferred Alternative, approximately 281,713 acres of lynx habitat are present in areas identified as suitable for winter motorized recreation. In these areas, snowmobiles would be allowed to operate in designated areas, such as unplowed forest roads, and away from forest roads in the designated areas. Much of the designated winter motorized areas are heavily forested, and occur in relatively steep terrain. Although openings or "play areas" are present, they tend to be limited across the SJNF. Some of the more popular designated play areas include the Wolf Creek Pass area, the Molas Pass – Coal Bank Pass areas, the Red Mountain Pass area, and west of the Durango Mountain Resort ski area.

The SJNF has completed a baseline snow compaction mapping (Schultz et al. 2006). Across the SJNF, there are approximately 101,027 acres of compacted snow in 100 individual areas. Of these, 82,043 acres of mapped snow compaction are within or immediately adjacent to LAUs. There are also approximately 1,663 linear miles of snow-compacted routes, of which 1,390 miles are within or lead recreational users into LAUs. And finally, there are 46 winter access points, of which 31 are within LAUs. Projects implemented under the Preferred Alternative would be evaluated for snow compaction and would assess potential effects to lynx from interspecific competition with other predators for available food sources (refer to the Competition and Predation section below).

Lynx are known to have been killed by vehicle collisions in Colorado, Minnesota, Maine, New York, and Idaho (USFWS 2008). Preliminary information suggests that lynx do not avoid roads (Ruggiero et al. 2000b), except at high traffic volumes. Additionally, lynx have shown no preference or avoidance of unpaved SJNF roads, and the existing road density does not appear to affect habitat selection (McKelvey et al. 2000). High traffic volumes may impede or create barriers to lynx movement and may increase the

likelihood of lynx mortality through vehicle collisions. To date, there have been no incidents reported where lynx have been killed by vehicle collision on roads managed by the USFS in the SRLA area (USFS 2008). The USFWS believes that lynx mortality on forest roads from vehicle collisions are less likely, due primarily to the relatively slow speeds at which vehicles on these roads travel (due to topography and road conditions (USFWS 2008).

The Preferred Alternative incorporates an objective and several guidelines from the SRLA to address potential impacts of forest roads. Objective HU 06 directs that adverse effects of highways can be reduced by working cooperatively with other agencies to provide for lynx movement and habitat connectivity, and to reduce lynx mortality. Guidelines HU G6, G7, G8, and G9 address issues such as upgrading forest roads, habitat connectivity, and brush removal. With application of the SRLA objectives and guidelines, potential effects to lynx from the use of forest roads are expected to be minimized.

There are numerous developed recreation areas (campgrounds, day use areas/visitor centers, or picnic areas) and one ski area (Durango Mountain Resort) occurring in lynx habitat on the SJNF. Existing facilities have been accounted for in the environmental baseline's existing habitat acreage. Developed recreation areas may have direct and indirect effects to lynx resulting from the direct loss of habitat and associated development of the surrounding areas. Any proposed recreational developments, such as campgrounds, may have additional impacts on lynx habitat and habitat use. These developments are usually small in acreage, so actual impacts to habitat and disturbances to lynx are expected to be minor.

Ski area developments such as the Durango Mountain Resort have had some historic impacts on lynx habitat including modifications of denning, foraging, and dispersal habitat, and increased disturbance. In some cases, however, occasional reports are received from the ski area indicating that lynx still utilize portions of the development. Monitoring of lynx by CPW also show use in and adjacent to the ski area. The Preferred Alternative includes approximately 603 acres of potential expansion associated with the Wolf Creek ski area. The entire potential expansion area contains suitable lynx habitat, and falls within the Wolf Creek Pass linkage area.

Future proposals to expand or modify existing facilities would incorporate guidelines for ski areas such as Guideline HU G1 (maintaining adequately sized inter-trail islands that includes course woody debris to provide for winter snowshoe hare habitat), G2 (provide lynx habitat consistent with ski area operation needs especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes), and G11 (consider locating access roads and lift termini to maintain and provide lynx security when developing or expanding ski areas and trails). Any future proposals to expand or modify existing facilities in the ski area would require and undergo project-specific NEPA analysis and Section 7 consultation with the USFWS.

Non-winter dispersed recreation activities such as hiking, mountain biking, horseback riding, camping, etc., are common forms of spring, summer, and fall recreation across the SJNF. Many of these activities occur in lynx habitat in both designated (on designated or established trails) and undesignated areas (areas open to cross-country travel). These activities represent low risk of adverse effects to lynx habitat, except possibly for disturbance near den sites.

Dispersed winter recreation use and activities such as snowmobiling, cross-country skiing, and snowshoeing are increasing in higher elevation environments. These activities may result in additional snow compaction and have negative influences on lynx habitat due to increases in snow compaction. Effects to lynx and lynx habitat from use of compacted snow routes are discussed below under competition and predation.

**Energy Development:** Under the Preferred Alternative, the most common of forms of energy development include oil and gas leasing and development. The SJNF is not a priority area for other energy development such as wind or solar energy. Under the Preferred Alternative, approximately 1,279,811 acres of NFS lands are available for oil and gas leasing. Designated wilderness areas and the Piedra Area are areas withdrawn from leasing by law. Additionally, approximately 73,636 acres are recommended for wilderness and WSR designation, and are administratively not available for lease.

The Preferred Alternative incorporates a number of lease stipulations that guide how potential development could occur across leased areas. Some land designations, which include lynx habitat, are withdrawn from leasing or are not available for leasing and would not be impacted by leasable minerals development. This would include areas with wilderness designation and those such as the Piedra Area. On lands available for leasing, lease stipulations are applied to protect various resources (soils, watersheds, terrestrial and aquatic wildlife and habitat, cultural resources, etc.) from adverse impacts from development activities. There is no NSO stipulation specific for lynx. However, roadless areas do have an NSO stipulation applied, and this would also apply to lynx habitat where it lies within roadless areas or any other areas where NSO is applied for any reason. For lands outside roadless areas, a full range of leasing stipulations are assigned including NSO, TL, CSU, and standard lease terms to protect various resources. All lynx habitat available for leasing is covered by NSO, CSU, TL, or standard lease terms. Standard lease terms apply to all lands available for leasing.

NSO, for any resource reason, prevent surface development on lynx habitat where if overlays that habitat. CSU and TL vary in requirements depending on their purpose. Therefore, the SJNF only inventories acreage specific to lynx CSU and TL within lynx habitat for the numbers reported below.

Of the total area available for lease, approximately 435,924 acres are present in lynx habitat. The different types of leasing stipulations are not mutually exclusive on any one piece of land and may, in fact, overlap on top of each other.

Of the total acreage in lynx habitat, an NSO stipulation has been applied across approximately 345,517 acres or 79% of the habitat. A CSU stipulation has been applied across all of the habitat and a TL stipulation has been applied across approximately 172,453 acres or 37% of the habitat. And finally, standard lease terms apply across approximately 16,241 acres or 3% of the habitat.

Under the Preferred Alternative, areas with high potential for prospective oil and gas development include the GSGP area, the Northern San Juan Basin, the San Juan Sag, and the Paradox Basin. The Paradox Basin and the San Juan Sag are development areas that contain lynx habitat.

Approximately 6,468 acres of lynx habitat are present in the GSGP area. Of the total habitat present in the GSGP area, approximately 6,026 acres are available for lease, of which 1,443 acres (24%) include an NSO stipulation, 4,458 acres (74%) include a CSU stipulation, 158 acres (3%) include a TL stipulation, and standard lease terms apply across 1,259 acres (21%).

Approximately 74,666 acres of lynx habitat are present in the San Juan Sag area. Of the total habitat present in San Juan Sag area, approximately 63,219 acres are available for lease, of which 54,580 acres (86%) include an NSO stipulation, 52,393 acres (83%) include a CSU stipulation, 11,537 acres (18%) include a TL stipulation, and standard lease terms apply across 368 acres (1%).

The leasing of areas with potential for mineral and energy development, and development of the areas, may result in impacts to lynx such as direct habitat loss and potential for increased disturbance from dispersed recreation activity. The increase in dispersed recreation activity may result in additional snow compaction and competition with competitors (coyotes [Canis latrans], foxes, mountain lion [Puma concolor], etc.). The Preferred Alternative incorporates objectives and guidelines from the SRLA that specifically address minerals and energy projects or actions to minimize the potential impacts to lynx and lynx habitat. Objective HU O5 refers to managing human activities such as mineral and oil and gas exploration and development to reduce impacts on lynx and lynx habitat. Guideline HU G4 encourages remote monitoring of sites and facilities to reduce snow compaction, and G5 addresses reducing impact to lynx habitat through reclamation of closed sites and facilities. G12 addresses limiting winter access for mineral and energy exploration and development by limiting access to designated routes or designated over-snow routes. With application of the SRLA objectives and guidelines, and lease stipulations listed in the Conservation Measures section, potential effects to lynx from mineral and energy developments are expected to be minimized.

**Livestock Management:** The Preferred Alternative designates where livestock grazing would occur on suitable lands across the SJNF. Suitable lands are lands that have been determined to have adequate

productivity for domestic livestock, while meeting forage needs for wildlife. Areas suitable for cattle and horse grazing exist on approximately 666,160 acres. Areas suitable for domestic sheep and goat grazing exist on approximately 76,921 acres. Of the areas suitable for cattle and horse grazing, approximately 346,472 acres contain lynx habitat of which approximately 266,304 acres are within active or vacant allotments. Of the areas suitable for domestic sheep and goat grazing, approximately 434,088 acres are in lynx habitat, of which approximately 311,412 acres are in active or vacant allotments.

Livestock grazing occasionally occurs in some lynx habitat; however, most grazing occurs in non-preferable areas such as open grassland and shrublands. Livestock grazing that occurs within lynx habitat has the potential to influence cover components utilized by snowshoe hare or influence food supplies such as the regeneration of aspen. The development of range improvements (fencing, stock ponds, spring developments, etc.) may also result in minimal habitat loss and minimal disturbance to individuals should they occur in the area. The Preferred Alternative incorporates one objective (GRAZ 01) and several guidelines (GRAZ G1, G2, G3, and G4) in the SRLA. With application of the SRLA objectives and guidelines, potential effects to lynx form livestock grazing are expected to be minimal.

#### **Management Actions Affecting Lynx Mortality**

**Trapping:** Lynx appear to be vulnerable to trapping and as a result may have been over exploited in the past. Road access may increase the vulnerability of lynx to trappers. At low population levels or in situations where reproduction or recruitment are low, trapping mortality can be additive and lead to population declines. Incidental trapping may occur where regulated trapping is permitted for other species (such as coyote and fox) whose range overlaps with that of the lynx.

Regulations on trapping are not within the jurisdiction of the USFS. Trapping is regulated by CPW. There is no trapping season for lynx in Colorado. It is possible that lynx could be incidentally trapped during trapping seasons for other species. Trapping with leghold traps for all species is illegal in Colorado. The final rule for listing indicates trapping does not currently appear to be a significant mortality factor in the SRMGA. The Preferred Alternative does not specifically address trapping activities on the SJNF. Trapping would continue to be regulated by CPW.

**Competition and Predation:** Buskirk et al. (in Ruggiero et al. 2000a) described the two major competition impacts to lynx as exploitation (competition for food) and interference (avoidance).

It is hypothesized that coyotes, bobcats (Lynx rufus), and mountain lions could be competitors with lynx.

Where historically the ranges of these species overlapped with lynx, deep snow excluded them from winter habitats for the lynx. Lynx have evolved a competitive advantage in deep soft snow environments that tend to exclude other predators during the middle of winter, a time when prey is most limiting.

Widespread human activity (snowshoeing, cross-country skiing, snowmobiling, snow cats, etc.) may lead to patterns of snow compaction that make it possible for competing predators such as coyotes and bobcats to occupy lynx habitat throughout the winter, reducing its value to and even possibly excluding lynx (Ruediger et al. 2000; Ruggiero et al. 2000a). The lynx and coyote seem to hunt under different snow conditions with coyotes using shallower and more compacted snow while lynx tend to use deeper snow areas. Coyotes have greatly expanded their range, and the use of packed snow trails and plowed roads may allow them to occupy winter habitats of lynx in some cases.

Plowed roads and snow compaction of roads and trails associated with a variety of forest management and recreational activities may also increase the potential for competitors to move into lynx habitat. The SRLA provides management recommendation to minimize the impacts from snow compaction to lynx and lynx habitat. Future projects and activities implemented under the LRMP would incorporate guidelines in the SRLA, notably HU G10, which addresses the non-expansion (outside baseline areas of consistent snow compaction) of designated over-snow routes or designated play areas, unless designation serves to consolidate use and improve lynx habitat. With application of the SRLA guidelines, potential effects to lynx resulting from snow compaction activities are expected to be reduced.

**Predator Control:** Predator control activities occur on the SJNF to protect livestock from predation. Predator control activities are conducted by the U.S. Department of Agriculture Animal and Plant Health Inspection Service, Wildlife Services. These activities are directed at specific animals or target species. Predator control activities that affect lynx or lynx habitat on NFS lands must be done in compliance with the ESA. These activities are subject to their own separate Section 7 consultation process and must be done in compliance with the LRMP. Predator control activities can occur in lynx habitat, but more often take place outside lynx habitat and at lower elevations.

Under the Preferred Alternative, predator control would be managed in cooperation with CPW, USFWS, Animal and Plant Health Inspection Service, and other appropriate agencies and cooperators in order to reduce damage to other resources (and to direct control toward removing only the offending animal). Preventive methods of denning, aerial gunning, and poisons of any kind towards predators would not be allowed on NFS lands within the planning area under any circumstances. Under these requirements, the risks of any adverse effects to lynx from predator control activities are expected to be low.

#### **Management Actions Affecting Lynx Movement**

Ruggiero et al. (2000b) indicates that we know little about the degree of connectivity or its role in the viability of lynx, but assumes that connectivity plays an important role. Protecting, maintaining, and improving lynx habitat afforded by the various conservation measures contribute to the conservation of lynx and population viability. Maintaining habitats to provide for dispersal movements and interchange among individuals and subpopulations may be the most important provision for maintenance of population viability contained in the LCAS. An interconnected ecosystem can be essential to maintain the ability of subpopulations to expand and colonize new habitats, recolonize areas where subpopulations have been locally extirpated, provide population support to declining populations, allow individuals to find mates among neighboring subpopulations, and affect dispersal and genetic interchanges (Noss and Cooperrider 1994).

The negative effects of highways on rare carnivores include habitat fragmentation, direct mortalities, direct loss of habitat, displacement due to noise and human activity, and secondary loss of habitat due to associated urban sprawl. When traffic volume increases, there is an evolution of highways from gravel roads to paved two-lane roads, and from two-lane highways to more problematic four-lane highways, and the interstate highways, which have the most adverse effects to wildlife movements. The result of this progression of upgrades in the transportation system is the mortality of individuals attempting to cross the highway and potential subpopulation isolation, both of which result in a slow decline in the population and ultimately can affect viability for some of the low density carnivores such as lynx and wolverine (Ruediger et al. 2000a). Critical points in development of highways occur when gravel forest or backcountry roads are paved, which results in higher speeds, higher traffic volumes, and increased human developments.

Habitat for lynx across the SJNF and SRMGA is naturally fragmented. The Preferred Alternative incorporates SRLA objectives, standards, and guidelines to maintain habitat connectivity across the SJNF. The application of SRLA objectives, standards, and guidelines would lessen adverse impacts to habitat from management actions across lynx habitat, and especially in identified linkage areas.

#### **Conservation Measures**

The Preferred Alternative would adhere to standards and Guidelines in the SRLA.

## **Minerals and Energy Lease Stipulations**

The following lease stipulations would be applied to minerals and energy leases where lynx habitat is present.

## Controlled Surface Use - Lynx, Landscape Linkage, Denning and Winter Foraging Habitat

Surface occupancy or use is subject to the following special operating constraints: Limitations on surface use and/or operational activities may be required. TL (especially during winter and/or in lynx

habitat) and restrictions on snow compaction activities may be applied in consultation with the USFWS as necessary to protect habitat and linkage area function and limit access by potential lynx competitors. Actions would be consistent with direction found in the LCAS, best available science as determined by the managing agencies and the USFWS, and/or the SRLA, each where applicable.

#### On the lands described below:

- Within identified current active denning locations
- Within identified landscape linkage areas
- Within identified lynx habitat in an LAU

For the purpose of: Protection of lynx and lynx habitat in compliance with the ESA.

*Justification:* The Canada lynx is a threatened species, with suitable habitat within portions of the SJNF. CSU would apply in these habitat areas to protect the habitat and the species.

**Exceptions**: The Authorized Officer in consultation with the USFWS may grant an exception to this stipulation if an environmental analysis and subsequent consultation indicates that the proposed or conditioned activities would not affect current and subsequent, suitability or utility of established lynx linkage corridors or lynx habitat within the LAU.

**Modifications:** The Authorized Officer, in consultation with USFWS, may modify the size of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is nonessential to function and utility of established lynx linkage corridors and lynx habitat, and not impair the utility of the corridors and LAU for current or subsequent lynx use or occupation.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS, only through a land use plan amendment if site conditions have changed sufficient to preclude current and subsequent lynx occupation of the LAU or use of linkage corridors.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or Forest Service Manual [FSM] 1950 and 2820.)

#### Timing Limitation - Lynx Denning Sites

**No surface use is allowed during the following time period:** March 1–August 30 (this stipulation applies to all lease activities).

No surface use is allowed during the following time period on the lands described below: Within 1 mile of known, active, den sites.

For the purpose of: Protection of denning habitat for Canada lynx in compliance with the ESA.

**Justification**: The Canada lynx is a threatened species, with suitable habitat within portions of the SJNF. A TL would apply in these habitat areas to protect the habitat and the species.

**Exceptions**: An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupation.

**Modifications**: The Authorized Officer, in consultation with USFWS, may modify the size of the stipulation area or time frames if an environmental analysis shows that the modification would not impair the utility of the habitat and LAU for current or subsequent lynx reproductive activity or occupation.

**Waivers**: A waiver of this stipulation may be granted by the Authorized Officer in consultation with USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Cumulative Effects**

The cumulative influences of numerous past, present, and future activities that may occur on various land ownerships within the southern Rocky Mountains could affect lynx and contribute positively or negatively toward its recovery in the state of Colorado. Land management activities that occur on the SJNF would be particularly important to the conservation of lynx because the majority of suitable habitat occurs in high-elevation forests on USFS lands. Some activities, features, or trends that occur on other land ownerships would also affect lynx within the greater southern Rocky Mountains. These include highways, commercial and residential development, expansion of recreational activities, and other uses that are closely tied to human population growth. While all of these cumulative actions/activities may negatively affect lynx and lynx habitat, the SJNF would continue to meet the goals and objectives of the LCAS and SRLA and provide vast amounts of suitable habitat for lynx. This is expected to result in the persistence of the species on the SJNF.

#### **Determination**

The Preferred Alternative "may affect and is likely to adversely affect" Canada lynx and lynx habitat. The primary reason for an adverse effect determination is due to direct and indirect effects associated with vegetation management across the SJNF. Under the Preferred Alternative, 23,307 acres of lynx habitat within the WUI would be exempt from standards VEG S1, S2, S5 and S6 for fuels treatments. Some or all of these acres would be treated in various ways that are incompatible with lynx habitat needs. Additionally, approximately 11,654 acres of lynx habitat can be treated under exceptions 1-4 in VEG S5 and exceptions 1-3 in VEG S6. Additional direct and indirect effects associated with the Preferred Alternative include habitat loss from recreational activities (development of facilities such as campgrounds, day use areas, trailhead parking areas, etc.), minerals and energy developments, and livestock grazing management. The activities may also result in disturbance impacts to lynx, which are expected to be limited in scale and duration. The Preferred Alternative also has potential to increase snow compaction, increasing the potential for competition with other predators for food resources and predation from competitors. The planning components in the LRMP include desired conditions, objectives, and design criteria that would continue to meet or exceed management considerations and recovery objectives associated with the lynx. The application of SRLA standards and guidelines is expected to reduce adverse effects to lynx, thereby maintaining the long-term persistence of the species across the SJNF.

## Uncompangre Fritillary Butterfly (Boloria acrocnema)

#### Background

The Uncompahgre fritillary butterfly was discovered in 1978 and described as a new species in 1980. This butterfly has the smallest range of any North American butterfly and is restricted to a small geographical area in the San Juan Mountains and southern Sawatch Range in southwest Colorado. The Uncompahgre fritillary butterfly is endemic to high elevation (>12,500 feet) alpine peaks of Colorado's San Juan Mountains. It was listed as endangered under the ESA in 1991 due to population declines observed in the 1980s (USFWS 1994). Over collection is considered the greatest human-caused threat to the species persistence.

The Uncompander fritillary butterfly is dependent on snow willow (*Salix reticulate nivalis*) for food and shelter, and even adult butterflies are rarely found far from patches of snow willow (USFWS 1994). The Uncompander fritillary butterfly has a biennial life cycle, with two overlapping populations representing even and odd years present at each occupied site (USFWS 1994). Eggs laid in year one become caterpillars, then become adults in year two. Adult butterflies fly for only about 3 weeks, usually beginning in early to mid-July (Dr. Kevin Alexander, Western State Colorado University, personal communication). Adult butterflies feed on nectar from a wide variety of alpine flowers. Females lay their

eggs on snow willow plants or in litter within snow willow patches, which shelters the caterpillars and provides them with their sole source of food.

Various concerns regarding the butterfly's continued persistence have been presented including extensive adult butterfly collection, possibility of disruption of larval microhabitat by livestock grazing, and prolonged local drought conditions (USFWS 1994). Trampling damage by livestock has been identified by the Recovery Team as a minor potential threat to Uncompanyer fritillary butterfly larvae.

Critical habitat has not been designated for this species. The SJNF continues to be part of the recovery team effort and would refine baseline habitat conditions for the Uncompange fritillary butterfly as the information warrants.

#### Status and Distribution

Since 1983, the number of known Uncompander fritillary butterfly colonies has increased as more extensive surveys have been initiated. Currently, the species is known or suspected to occur at 11 colony sites, all of which contain various numbers of population clusters (Alexander and Keck 2011). After at least 10 years of intensive inventory, all probable locations for finding additional Uncompander fritillary butterfly colonies are nearly exhausted. There are no additional priority sites to survey on the SJNF that may possibly support the species.

Currently, there are enough known colonies of sufficient size to down list the Uncompangre fritillary butterfly. However, the down listing criteria calls for 10 stable colonies for a period of 10 years, and not enough colonies have been known for that long. There is also a need for more long-term monitoring data to determine population changes over time. Enough quantitative population information has been collected over the years to start statistical analysis to establish population trend information at the end of the 2011 field season. Continued monitoring and confidentiality of the colony locations are the primary conservation measures that would be pursued to aid in the recovery of this species.

The Uncompander fritillary butterfly was not known to occur on the SJNF until 2004 when two of six habitat patches of one colony on adjacent NFS land were identified as occurring east of the Continental Divide. These two patches contain approximately 10 acres of snow willow and have been identified as Patch H and Patch G in the annual Uncompander fritillary butterfly monitoring reports (Ellingson 1998). There are no habitat threats identified for this colony due to its remoteness, and the habitat patches are suspected to be stable because of annual presence. The existing data indicate that the population is persistent and that the colony currently remains one of the most extensive of the known populations (Ellingson 2003).

#### Habitat for Uncompangre Fritillary Butterfly across Its Geographic Range

The primary habitat for the Uncompahgre fritillary butterfly consists of suitable snow willow patches that are located above 12,000 feet at north through east aspects. In general, these habitats involve very high maximum elevations (often above 13,500 feet), extensive contiguous areas of suitable elevation and aspect, and rolling or terraced terrain. Snow willow serves as the host plant for the eggs and larvae of the Uncompahgre fritillary butterfly, and suitable snow willow sites appear to be restricted to topographic features that occur rarely. They often involve glacial cirque, and are remote and inaccessible. These patches are usually situated below snow fields lasting late into the summer, which provides a source of melt water for snow willow plants during the brief summer growing season.

#### Habitat on the San Juan National Forest

Initial efforts on the SJNF identified and surveyed approximately 3,200 acres of potential Uncompanding fritillary butterfly habitat without discovering any colonies or high-potential habitat (Ellingson 2001). Rather, the surveys indicated that characteristics of snow willow on the SJNF differ from those in the remainder of the species range and, where patches do occur, they are rarely extensive enough to support the Uncompanding fritillary butterfly. The reasons for this are unclear, but may be related to soil and moisture factors.

Existing Uncompahgre fritillary butterfly habitat is located in the Weminuche wilderness. Existing management activities in the area include livestock grazing and recreation management. Occupied habitat is located in a small section of the Pine River Domestic Sheep and Goat Grazing Allotment. Grazing in the portion of the Pine River Allotment where the Uncompahgre fritillary butterfly colony is located began in the very early 1900s and continued annually through 1980. The Pine River Allotment was last grazed by domestic sheep in 1980. The permitted grazing season was mostly from July 1 through September 15 each year. The area where the Uncompahgre fritillary butterfly colony is located was permitted for 2,000 head of sheep until 1947. Beginning in 1948, the permitted numbers were reduced to 850 through 1950, then increased to 1,050 head in 1951, where it remained until 1978. In 1978, this area was combined with two other areas to form the current Pine River Allotment. The combined Pine River Allotment was permitted for 850 head, but grazing actually occurred for only three more seasons, being last grazed in 1980. There is ongoing NEPA analysis (Weminuche Sheep Grazing Analysis) that proposes to close the Pine River Allotment to all livestock grazing. Currently, there are no impacts to the Uncompahgre fritillary butterfly colony from grazing as the area has not been grazed since 1980.

Recreation activities (day hiking and backpacking) occur in the vicinity of the Uncompange fritillary butterfly colony. The activities are mostly incidental, and to date no adverse impacts to the colony have been documented.

There are four small areas in the Rock Creek Domestic Sheep and Goat Grazing Allotment located in the Weminuche wilderness, totaling 233 acres, that appear to have suitable Uncompangre fritillary butterfly habitat attributes and the potential for butterfly occurrence appears to be high. Dr. Kevin Alexander, the lead USFWS interagency species recovery team butterfly researcher, has visited the area and believes there is high potential for Uncompangre fritillary butterfly occurrence. However, the area has not been surveyed during the primary Uncompangre fritillary butterfly survey season to adequately determine the status of butterfly occurrence. For this reason, until the area can be adequately surveyed, the area would be presumed to be occupied by Uncompangre fritillary butterfly and domestic sheep would be managed to avoid and not impact habitat. The Rock Creek Allotment is proposed for forage reserve status under the Preferred Alternative of the ongoing Weminuche Sheep Grazing Analysis.

Domestic sheep grazing in the Rock Creek Allotment began in the very early 1900s and continued annually through 1970. The Rock Creek Allotment has not been grazed by sheep since 1971. Early on, the Rock Creek Allotment was combined with the Leviathan Allotment, and the combined allotment was permitted for 1,300 head of sheep from 1928 through 1930. In 1931 the permitted number on the combined allotment was increased to 1,500 head. In 1932, the Rock Creek Allotment was separated from the Leviathan Allotment, and the number permitted on Rock Creek was reduced to 600 head. In 1947, the Rock Creek Allotment was combined with the adjacent Vallecito Allotment and the combined allotment was permitted for a total of 850 head (reduced from a previous combined total of 1,800 head across both allotments). The permitted number for the combined Rock Creek Allotment remained at 850 head until grazing ended in 1970.

As part of the ongoing NEPA analysis, a polygon was delineated with assistance from the USFWS that includes the four small potential Uncompander fritillary butterfly areas, within which domestic sheep grazing activities would be restricted. This restricted area polygon was designed to have boundaries that can be readily identified on the ground by sheep herders managing the domestic sheep flocks. This polygon is 676 acres in size. The grazing permittee is responsible for ensuring their herders manage the movement, activities, and presence of sheep around this restricted area polygon to ensure that grazing sheep do not enter the area or degrade butterfly key habitat attributes.

Salting, bedding, and intentional grazing of sheep would not be permitted in this restricted area polygon. Trailing through the polygon would not be necessary because of its location along a very steep and rugged margin of the forage reserve allotment that is not needed to be crossed to move sheep within the allotment or move sheep to or from other allotments.

There are no system trails leading into the area around the polygon but the area receives regular dispersed recreation by backpackers and climbers on user-created trails. Peaks around the polygon are

popular with climbers, and the basin adjacent to the polygon provides a well-used route to and from the climbing areas.

#### **Direct and Indirect Effects**

There are few management actions associated with the LRMP that may affect the Uncompahgre fritillary butterfly or its habitat because the species is restricted to higher-elevation alpine habitats that are often inaccessible. Most of the potential habitat is also protected as designated wilderness. The one known colony with habitat patches on the SJNF is considered secure and stable. There are no habitat threats identified for this colony due to its remoteness, and the habitat patches are suspected to be stable because of presence from long-term monitoring. The existing data indicate that the population is persistent and that the colony currently remains one of the most extensive of the known populations (Ellingson 2003).

As mentioned previously, the ongoing Weminuche Sheep Grazing Analysis proposes to close the Pine River Allotment to all livestock grazing. Currently, there are no impacts to the Uncompanding fritillary butterfly colony in the Pine River Allotment from grazing as the area has not been grazed since 1980. As part of the Weminuche Sheep Grazing Analysis, a restricted area has been identified in Uncompanding fritillary butterfly habitat in the Rock Creek Allotment that would ensure domestic sheep do not enter the area or degrade key butterfly habitat attributes. As noted previously, various forms of recreational use occur in the vicinity of the current Uncompanding fritillary butterfly colony and in the areas presumed to be occupied by Uncompanding fritillary butterfly in the Rock Creek Allotment. There have been no impacts to Uncompanding fritillary butterfly habitat reported from recreational activities.

Most of the potential habitat on the SJNF is considered poor quality and occurrence is unlikely. Within some of these locations, however, it is possible that recreational activities and/or livestock grazing might influence habitat or individuals if occurrence is eventually documented. Where access to habitat areas exists, the risk of illegal collection may also increase if the species is found there in the future.

In summary, management activities implemented under the Preferred Alternative are not expected to have any adverse direct or indirect effects to occupied Uncompander fritillary butterfly habitat in the Pine River Domestic Sheep Grazing Allotment or habitat patches presumed to be occupied in the Rock Creek Domestic Sheep Grazing Allotment. The LRMP standards and guidelines adopt the Uncompander Fritillary Butterfly Recovery Plan (USFWS 1994) and the interagency agreement to conserve the species. The SJNF would continue to participate in and adopt the relevant findings from the annual field report, the interagency recovery team, and new direction as agreed to in consultation with the USFWS to further management and conservation of the species. Butterfly surveys would be conducted before proposed actions are implemented in suitable habitat, and actions that would negatively impact known habitat or populations would be avoided. In areas of occupied habitat, regulations that prohibit collecting would be implemented and enforced by the agencies.

#### **Conservation Measures**

In addition to adopting the conservation measures identified in the Uncompangre Fritillary Butterfly Recovery Plan, the LRMP revision has the following standard that further protects Uncompangre fritillary butterfly habitat and populations

#### Standard

**Butterflies:** Management actions that could adversely impact reproductive habitat for occupied BLM and USFS sensitive butterfly species must be designed to sustain host plant species.

#### **Cumulative Effects**

The Uncompanded fritillary butterfly has been recorded only above 12,500 feet in elevation. There are few activities on federal lands that are expected to influence the existing known population or potential habitat for the species. The only private lands that occur at that elevation within the boundary of the SJNF are mining claims, most of which are no longer active. Although unlikely, there is a potential that

some high-elevation private lands could continue to influence potential habitat for the Uncompanding fritillary butterfly. However, the vast majority of potential habitat occurs on public lands and is expected to remain secure from potential impacts. No other actions on private or state lands have been identified that would affect the potential habitat for this species.

#### **Determination**

Actions associated with the Preferred Alternative are expected to have minimal influences on the Uncompangre fritillary butterfly and its habitat. The planning components in the LRMP include desired conditions, objectives, and design criteria, including mitigation, and conservation measures that would continue to meet or exceed management considerations and recovery objectives associated with the Uncompangre Fritillary Butterfly Recovery Plan. With implementation of the recovery plan, direction in the LRMP, and direction as agreed to in consultation with the USFWS, the Preferred Alternative **may affect**, **but is not likely to adversely affect** Uncompangre fritillary butterfly and its habitat. Separate site- and project-specific NEPA analysis would occur if any activities are proposed in or near potential Uncompangre fritillary butterfly habitat.

## Southwestern Willow Flycatcher (Empidonax traillii extimus)

#### Background

The southwestern willow flycatcher is one of four or five recognized subspecies of the willow flycatcher (Sedgwick 2001). It is a neotropical migratory bird that breeds in the southwestern United States. In the late summer or early fall it migrates south into Mexico and Central America. Historically it was found in southern California, Arizona, New Mexico, west Texas, southwest Colorado, south Utah, extreme southern Nevada, and extreme northwestern Mexico (Unitt 1987).

In March 1995, the southwestern willow flycatcher was listed as a federally endangered species by the USFWS. The USFWS recently revised its 2005 designation of critical habitat for the species, identifying 1,227 stream miles within the 100-year floodplain of waters in California, Arizona, Nevada, Utah, Colorado, and New Mexico, encompassing a total area of approximately 208,973 acres (USFWS 2013e). During this designation, there was no critical habitat identified on the SJNF.

Southwestern willow flycatchers are considered to be a riparian-obligate species nesting in riparian willows (Salix sp.), buttonbush (Cephalanthus occidentalis), box alder (Acer negundo), saltcedar (Tamarix sp.), and other riparian associated species. There is currently no upper elevation limits described for the species. Habitat may consist of riparian willows or other suitable vegetation at least 5 feet high and as small as 30  $\times$  30 feet in area. This small area may be composed of subsequent smaller patches in close proximity.

The southwestern willow flycatcher is an insectivore, foraging within and above dense riparian vegetation, feeding on insects on the wing or gleaning them from within the vegetation (USFWS 2002a). Parasitism by brown-headed cowbirds (*Molothrus ater*) is a serious problem. These birds lay their eggs inside the willow flycatcher's nest and remove some of the flycatcher's eggs. In addition, the loss of riparian vegetation and the replacement of native vegetation with exotic species are occurring within the range of the willow flycatcher. Low numbers of nesting pairs within their range may affect population viability (USFWS 2002a). The nesting season which begins in late May and early June and fledging from late June through mid-August (USFWS 2002a), is the most critical time to prevent nest parasitism or nest predation from occurring

The final rule determining endangered status for the southwestern willow flycatcher listed a variety of threats to the species. The primary threats include the following:

- 1. Large-scale loss of riparian wetlands, particularly cottonwood (*Populus* sp.)/willow, and changes in riparian plant communities resulting in the reduction, degradation, and elimination of nesting habitat. These losses and changes can result from:
  - a) Water diversion, impoundment, and channelization,
  - b) OHV and other recreational uses,

- c) Impacts from livestock grazing, which affects plant community structure, species composition, and relative abundance of species and plant density.
- d) Invasion by the exotic saltcedar,
- e) Logging in the upper reaches of southwestern rivers, which could increase the likelihood of damaging floods in southwestern willow flycatcher nesting habitat.
- 2. Predation, which may be increasing with habitat fragmentation.
- 3. Brood parasitism by brown-headed cowbirds.
- 4. Direct mortality from livestock grazing in and near occupied habitat. Livestock in riparian habitats sometimes make physical contact with nests or supporting branches, resulting in destruction of nests and spillage of eggs or nestlings.
- 5. Pesticides in agricultural areas, and recreation, particularly during the warm summer months, may constitute potential threats.

#### Status and Distribution on the San Juan National Forest

The current survey information suggests that southwestern willow flycatchers are localized and uncommon in southwest Colorado. Despite extensive surveys and suspected suitable habitat in some locations, there are no confirmed breeding populations on the SJNF. The total population of southwestern willow flycatcher consists of one site on the Weminuche Devil Grazing Allotment that has been occupied intermittently for at least 10 years by zero to four singing males (USFS 2005b). The population at this site is too small to detect a long-term trend, but the pattern of occupancy indicates occurrence of individual flycatchers has persisted over the past 10+ years and therefore continued survey and monitoring efforts are warranted. Direction concerning maintenance of habitat for this site results from that found in the species' recovery plan and that developed in consultation with the USFWS. This direction is adopted by the plan as other referenced guidance within the LRMP's terrestrial wildlife section. If occupation or nesting is observed elsewhere on the SJNF, consultation with the USFWS would be initiated. There have been no reports of southwestern willow flycatchers elsewhere across the across the SJNF.

Increasing trends in southwestern willow flycatcher populations across the species range and limited suitable riparian habitat on the SJNF suggest that habitat is available if the subspecies eventually begins nesting on the SJNF. The current information suggests that the SJNF does not measurably contribute to the recovery or overall viability of the southwestern willow flycatcher. The possibility of future individual breeding pairs, however, cannot be discounted as the recovery of the subspecies expands. Continued monitoring of potential and occupied habitats would continue to utilize the USFWS protocol. Maintenance of occupied habitats, if and when identified, would occur to aid in the recovery of this species.

#### Habitat for Southwestern Willow Flycatcher across Its Geographic Range

The southwestern willow flycatcher breeds in dense riparian habitats in all or parts of seven southwestern states, from sea level in California to over 8,500 feet in Arizona and southwest Colorado (Finch and Stoleson 2000). The species breeds only in dense riparian vegetation near surface water or saturated soil (Finch and Stoleson 2000). Other habitat characteristics such as dominant plant species, size, and shape of habitat patch, canopy structure, vegetation height, etc., vary widely among sites. In Colorado, willow or other riparian habitat must be on average at least 5 feet high to be suitable for southwestern willow flycatcher (USFWS 2003, 2011b). Below 8,500 feet, habitat patches as small as 0.25 acre (30 feet wide by 30 feet long by average 5 feet high) could support a flycatcher territory. Above 8,500 feet, however, a minimum patch size of 5 acres or greater is considered necessary to support breeding territories in Colorado (USFWS 2011b). These minimum territory sizes may be made up of two or more closely associated smaller patches of habitat. Slow moving or standing surface water, or subsurface water, is nearly always found near breeding territories, but habitat occupancy cannot be ruled out if habitat of sufficient width exists near flowing streams.

#### Habitat on the San Juan National Forest

A habitat model was developed to identify suitable southwestern willow flycatcher habitat across the SJNF. The model was developed in cooperation with the USFWS and contains many of the

characteristics and criteria described above. The habitat model has identified 846 acres of suitable southwestern willow flycatcher habitat. Most of the suitable habitat consists of patches that are less than 5 acres in size. Existing habitat across the SJNF occurs in elevations up to approximately 10,500 feet. Current management actions occurring in habitat include domestic livestock grazing (mostly cattle), recreational use (developed and dispersed recreation), and to a lesser extent other management actions such as prescribed fire, watershed restoration, timber management, minerals and energy development, and lands and special uses management. Presently, the primary activity with potential to affect southwestern willow flycatcher consists of livestock grazing in suitable and occupied habitat. Livestock grazing in suitable and occupied habitat occurs under criteria developed in conjunction with the USFWS for the Williams Reservoir site. If occupation or nesting is identified elsewhere on the unit consultation would be initiated. Potential effects associated with other management actions mentioned previously are largely mitigated through the use of timing restrictions or avoidance of habitat.

#### **Direct and Indirect Effects**

Risk factors associated with the southwestern willow flycatcher under the Preferred Alternative are similar to those described elsewhere throughout the species' range and primarily related to activities that may occur within or influence willow-riparian systems. These include activities that might occur directly within suitable habitat, such as livestock grazing, recreation, minerals and energy development, vegetation management, or activities that may occur off-site but indirectly influence the health of riparian systems. Examples of the latter category include roads, OHV use, and numerous other activities.

These risk factors can influence the amount and distribution of riparian vegetation that may provide breeding habitat for the southwestern willow flycatcher (Marshall and Stoleson 2000; Tibbetts et al. 1994). Activities that occur within or near southwestern willow flycatcher habitat are of concern because they may increase the potential for injury or mortality, loss and degradation of habitats, nest parasitism, and disturbance resulting from human activity. LRMP direction is expected to minimize or eliminate effects to the flycatcher and maintain or improve habitat condition for the species as listed under the conservation measures. Examples of potential risk factors under the Preferred Alternative are as follows.

Livestock grazing: Under the Preferred Alternative, approximately 306 acres of suitable southwestern willow flycatcher habitat exists in active/vacant cattle and horse allotments. Approximately 305 acres of suitable habitat exists in active/vacant domestic sheep and goat grazing allotments. Livestock grazing has potential to affect plant community structure, species composition, and relative abundance of species and plant density. Grazing also has potential to disturb and physically impact nest sites. Grazing management in the occupied pasture at Williams Reservoir was modified in consultation with USFWS. No other occupation is known on the SJNF. With application of livestock grazing conservation measures listed below, adverse effects to southwestern willow flycatcher and habitat for the species area expected to be minimized. Consultation would be initiated if additional occupation or nesting is observed on the SJNF.

**Recreation Management:** Under the Preferred Alternative, a variety of developed and dispersed recreation activities have potential to affect southwestern willow flycatcher habitat. Approximately 3 acres of suitable habitat is associated with developed recreation sites. The potential effects associated include disturbance and limited habitat loss associated with brushing activities to improve site distances and to achieve other vegetation management objectives at the developed recreational sites. The potential for human disturbance and displacement of the species also exists for these sites. There is no known occupation of habitat within the developed recreational sites. Consultation would be initiated if occupation or nesting is observed at these sites.

Dispersed recreation activities (day hiking, fishing along stream corridors, wildlife watching, horseback riding, etc.) also have potential to cause disturbance during the nesting season. Direct impacts to habitat are less likely from dispersed recreation, although some activities such as repeated use, and therefore creation of trails into habitat, could result in minor habitat loss and disturbance. Generally, suitable habitat is not traversed by recreationists due to site characteristics. Recreationists usually take the path of least resistance when on foot or horseback and choose easier routes outside flycatcher habitat. Impact to habitat from these activities is expected to be minimal. Subsequent site-specific, project-level analysis

would be conducted during LRMP implementation, with potential impacts to southwestern willow flycatcher and habitat minimized through application of LRMP design criteria and other efforts to minimize adverse effects from developed and dispersed recreation activities. The USFS and USFWS conducted informal consultation with a site visit to the Williams Reservoir occupation site and did not identify any dispersed recreation issues that needed to be addressed for the site. There is strong LRMP direction for maintaining habitat condition in southwestern willow flycatcher habitat as discussed below in Conservation Measures. No known nesting occurs on the SJNF. Consultation would be initiated if additional occupation or nesting is observed on the SJNF.

**Energy Development:** Under the Preferred Alternative, the most common of forms of energy development include oil and gas leasing and development. The SJNF is not a priority area for other energy development such as wind or solar energy. Under the Preferred Alternative, approximately 1,279,811 acres of NFS lands are available for oil and gas leasing. Designated wilderness areas and the Piedra Area are areas withdrawn from leasing by law. Additionally, approximately 67,700 acres are recommended for wilderness and WSR designation, and are administratively not available for lease.

The Preferred Alternative incorporates a number of lease stipulations that guide how potential development could occur across areas leased areas. Lease stipulations are applied to protect various resources (soils, watersheds, terrestrial and aquatic wildlife and habitat, cultural resources, etc.) from adverse impacts from development activities. Roadless areas have an NSO stipulation, and for lands outside roadless areas, a full range of leasing stipulations are assigned including NSO, TL, CSU, and standard lease terms to protect various resources.

Of the total area available for fluid minerals lease, approximately 283 acres are present in southwestern willow flycatcher habitat.

The different types of leasing stipulations are not mutually exclusive on any one piece of land and may, in fact, overlap on top of each other. Of the total acreage in southwestern willow flycatcher habitat, an NSO stipulation has been applied across approximately 242 acres or 86% of the habitat available for lease. A CSU stipulation has been applied across 271 acres or 96% of the habitat, and TL has been applied across approximately 283 acres or 100% of the habitat.

The previous paragraph includes all areas of potential leasing within southwestern willow flycatcher habitat. Most of these acres fall into areas of geological formation that show little to no potential for containing or recovery of fluid minerals. Under the Preferred Alternative, leasable areas with high potential for prospective oil and gas development include the GSGP area, the Northern San Juan Basin, the San Juan Sag, and the Paradox Basin. The San Juan Sag is the only high potential development area that contains habitat for southwestern willow flycatcher. Approximately 29 acres of southwestern willow flycatcher habitat are present in the San Juan Sag area. Of the total habitat present in San Juan Sag area, 25 acres are available for lease. NSO, CSU, and TL stipulations, which overlap here, are applied across all 25 acres.

The leasing of areas with potential for mineral and energy development, and development of the areas, may result in impacts to southwestern willow flycatcher such as direct habitat loss, and potential for increased disturbance from noise, human presence, and other activities. The addition of lease stipulations applied across the vast majority of southwestern willow flycatcher habitat would minimize adverse effects resulting from loss of habitat and disturbance during the breeding season. Site-specific analysis would be conducted for any new developments, with potential impacts to southwestern willow flycatcher and habitat minimized through application of LRMP design criteria and other efforts to minimize adverse effects from mineral and energy developments. This would include direction such as that found within the Watershed Conservation Practices Handbook; for example, Allow no action that will cause long-term change away from desired condition in any riparian or wetland vegetation community. Consider management of stream temperature and large woody debris recruitment when determining desired vegetation community. In degraded systems, progress toward desired condition within the next plan period. (USDA Forest Service 2006)

**OHV Use:** Under the Preferred Alternative, the use of OHVs is restricted to designated motorized routes to be consistent with national direction, which is incorporated into the LRMP as other referenced guidance. Any new designations would be evaluated through site-specific NEPA analysis, and appropriate measures would be taken to either avoid or minimize direct impacts to southwestern willow flycatcher habitat, and potential disturbance. Analysis of the impacts of travel management actions on southwestern willow flycatcher habitat would be further evaluated in a separate but related process—travel management planning. The SJNF is currently in the process of travel management planning in response to new national direction for all NFS lands. During travel management planning, more detailed analysis of roads and trails that would be open, closed, or created would be analyzed. Impacts to southwestern willow flycatcher would be considered, as well as other resources and use patterns in developing these transportation plans. Where appropriate, consultation would be initiated concerning southwestern willow flycatcher as project-level analysis occurs for landscapes.

On NFS lands, motorized travel would be limited to existing designated routes, except where specifically authorized or through a travel management plan decision. Because the SJNF has completed travel management planning on more than half of the lands (as well as closing cross-country travel through a special order), there is less cross-country travel on SJNF lands. Project-level implementation must be compliant with Section 7 requirements and LRMP direction. The LRMP contains direction to minimize or eliminate effects to habitat and potential disturbance. Project implementation would be required to follow LRMP direction, which includes that found under the species' recovery plan and any additional direction developed in consultation with the USFWS. These are listed under other referenced guidance in the terrestrial wildlife section of the LRMP.

#### **Conservation Measures**

Land and Resource Management Plan Standards and Guidelines and Other Referenced Guidance: LRMP Section 2.1 Ecological Framework and the Conservation of Species explains the approach the LRMP takes in providing for species (Appendix J.A). The LRMP contains numerous standards and guidelines that provide for the species and its habitat on the SJNF. These provide for basic ecological components of soils, water, and air, to those more specifically focused on maintaining or improving the riparian habitat characteristics required by the species. This guidance is found under the various resource sections of the LRMP. Most of the relevant direction is found under LRMP sections, including Terrestrial Wildlife, Riparian Area and Wetland Ecosystems, Aquatic Ecosystems and Fisheries, Water Resources, Livestock and Rangeland Management, and Invasive Species. Examples include:

- 2.4.21. Management actions must not cause long-term change away from desired conditions in riparian or wetland vegetation communities.
- 2.4.25. Livestock browsing should not remove more than 25% of the annual leader growth of hydrophytic shrubs and trees.
- 2.4.26. Agency actions should avoid or otherwise mitigate adverse impacts to the abundance and distribution of willows to maintain or improve the ecological integrity of riparian area and wetland ecosystems.
- 2.4.28. Woody riparian vegetation along low-gradient ephemeral and permanent stream channels should be maintained or restored to ensure terrestrial food sources for invertebrates, fish, birds, and mammals, and to minimize water temperature changes.
- 2.5.18a. From April 1 through September 30, an instantaneous minimum flow equal to 40% of the average annual flow; from October 1 through March 31, an instantaneous minimum flow equal to 20% of the average annual flow (Tennant 1972).
- 2.6.30. Activities must not be allowed within aquatic management zones that will cause a
  long-term change from desired conditions. The protection or improvement of riparian values,
  water quality, aquatic community, and for long-term stream health in these areas must be
  emphasized. Aquatic management zones have a minimum horizontal width from the top of
  each bank of 100 feet or the mean height of the mature late-seral vegetation, whichever is
  greater.
- 2.7.13. Project-level NEPA analysis and decisions, and the resultant AMPs, must identify key herbaceous and woody plant species and their respective utilization guidelines.

- 2.7.22. Grazing management activities should be modified in, or livestock excluded from, riparian areas that are "nonfunctional" or "functional-at risk" with a downward trend (as rated by the Proper Functioning Condition protocol), where livestock have been determined to be a key causative agent.
- 2.7.23. Trailing of livestock should be avoided along riparian areas to the extent practicable.
- 2.8.11. Invasive species must be managed using integrated weed management principles.
- 2.8.18. For all proposed projects or activities, the risk of invasive aquatic and plant species introduction or spread should be determined and appropriate prevention and mitigation measures implemented.

Where guidance already exists, it is not repeated in the LRMP but is captured as "Other Referenced Guidance" under each resource section of the LRMP. These include guidance such as that found under agency manuals and handbooks, threatened and endangered species recovery plans, and direction resulting from consultation, law, regulation, policy, MOUs, etc. Some of the more applicable guidance to the southwestern willow flycatcher is discussed below. Stipulations concerning development of leasable minerals have been developed for the LRMP and are also discussed below.

Forest Service Handbook (FSH) 2509.25, Watershed Conservation Practices Handbook: This handbook contains extensive guidance for NFS lands for maintaining and/or improving the ecological functioning and vegetation potentials within the riparian zone. Some examples of applicable direction include:

- Allow no action that will cause long-term change to a lower stream health class in any stream reach. In degraded systems (that is At-risk or Diminished stream health class), progress toward robust stream health within the next plan period.
- Allow no action that will cause long-term change away from desired condition in any riparian
  or wetland vegetation community. Consider management of stream temperature and large
  woody debris recruitment when determining desired vegetation community. In degraded
  systems, progress toward desired condition within the next plan period.
- Maintain the organic ground cover of each activity area so that pedestals, rills, and surface runoff from the activity area are not increased. The amount of organic ground cover needed will vary by different ecological types and should be commensurate with the potential of the site.
- Restore the organic ground cover of degraded activity areas within the next plan period, using certified local native plants as practicable; avoid persistent or invasive exotic plants.
- Locate new concentrated-use sites outside the water influence zone (WIZ) if practicable and outside riparian areas and wetlands. Armor or reclaim existing sites in the WIZ to prevent detrimental soil and bank erosion.
- Manage livestock use through control of time/timing, intensity, and duration/frequency of use in riparian areas and wetlands to maintain or improve long-term stream health. Exclude livestock from riparian areas and wetlands that are not meeting or moving towards desired condition objectives where monitoring information shows continued livestock grazing would prevent attainment of those objectives.
- Keep stock tanks, salt supplements, and similar features out of the WIZ if practicable and out
  of riparian areas and wetlands always. Keep stock driveways out of the WIZ except to cross
  at designated points. Armor water gaps and designated stock crossings where needed and
  practicable.
- Design grazing systems to limit utilization of woody species. Where woody species have been historically suppressed, or where the plant community is below its desired condition and livestock are a key contributing factor, manage livestock through control of time/timing, intensity, and duration/frequency of use so as to allow for riparian hardwood growth extension and reproduction. Manage woody species in riparian areas to provide for stream temperature, bank stability and riparian habitat.
- Adjust management in riparian areas and wetlands to improve detrimental soil compaction whenever it occurs.

**Southwestern Willow Flycatcher Species Recovery Plan:** A flycatcher habitat "patch" contains relatively contiguous willow/woody riparian vegetation, but open areas within the patch may commonly occur. It is up to the professional judgment of biologists certified by the USFWS in flycatcher survey methods to determine the continuity of habitat and what constitutes a flycatcher habitat patch.

In addition to adopting the conservation measures identified in the Southwestern Willow Flycatcher Recovery Plan, the SJNF has consulted with USFWS to develop more applicable guidance for habitat identification, and inventory and monitoring procedures that better fit the unique nature of flycatcher habitat on the SJNF, below. Habitat for southwestern willow flycatcher on the SJNF is present at elevations exceeding most areas across the species range (USFS 2012). The USFWS responded with a letter concurring with the following discussed habitat definitions, periodicity of site visits, and survey protocol, and would serve as guidance for Section 7 consultation until new information becomes available (USFWS 2012a).

**Habitat Definitions:** A flycatcher habitat patch contains relatively contiguous willow/woody riparian vegetation, but open areas within the patch may commonly occur. It is up to the professional judgment of biologists certified by the USFWS in flycatcher survey methods to determine the continuity of habitat and what constitutes a flycatcher habitat patch.

Suitable flycatcher habitat on the SJNF is defined as a patch that is at least 30 feet in width, on average at least 5 feet in height, has a relatively dense canopy cover (roughly 60% or greater) dominated by willows as well as understory vegetation, and has relatively slow or standing surface water present within the patch during most of the flycatcher breeding season, sufficient to maintain suitable vegetation conditions and insect prey abundance.

Willow patches greater than 0.25 acre in size and at least 30 feet wide and averaging greater than 5 feet in height are considered suitable for flycatcher occupancy. However, in response to USFWS guidance, for habitat above 8,500 feet in elevation, only those willow patches greater than 5 acres in size are required to be surveyed for flycatcher occupancy. Previously, above 8,500 feet, all habitat patches down to 0.25 acre in size required surveys. This change in USFWS guidance recognizes that habitat above 8,500 feet declines substantially in the potential for supporting flycatchers and therefore limited survey and monitoring resources should be focused on the largest patches of habitat that have the greatest potential for flycatcher occupancy. However, if flycatchers were located in a habitat patch less than 5 acres in size, full habitat protection and flycatcher monitoring requirements would be applied to that site.

**Periodicity of Site Visits:** Above 8,500 feet, only patches of suitable flycatcher habitat greater than 5 acres in size require protocol surveys prior to project implementation, compared to the previous requirement to survey all patches greater than 0.25 acre in size. Additionally, above 8,500 feet, only 1 year's worth of protocol survey effort is required in suitable flycatcher habitat, compared to the previous 2-year survey requirement.

Below 8,500 feet, patches greater than 0.25 acre in size require surveys prior to project implementation, and only 1 year's worth of protocol survey effort is required.

New proposed project actions, including renewal of term grazing permits, require surveys of suitable flycatcher habitat. A determination about whether surveys are needed should be based on the patch size and elevation criteria described above. Flycatcher surveys should be completed prior to, but not more than 1 year before, signing the NEPA decision or term permit renewal. If surveys cannot be completed prior to signing the decision, the decision document should include provisions for completing surveys before project implementation begins and include mitigation/conservation measures that would be implemented if flycatchers were detected during those surveys.

Within active livestock allotments, the USFWS believes surveying suitable flycatcher habitat patches only once every 10 years is not sufficient to determine if flycatchers have occupied suitable habitat and/or make decisions about appropriate management responses. For this reason, protocol flycatcher surveys should be completed prior to, but not more than 1 year before signing the 10-year term permit renewal, and at least once every 5 years thereafter during the term of the permit. If grazing management changes

or monitoring shows that suitable flycatcher habitat is not being maintained in a stable or upward trend, the USFWS should be contacted to determine if more frequent surveys may be required and/or changes in livestock management practices is necessary.

For allotments that are stocked annually under valid term grazing permits, suitable flycatcher habitat patches should be resurveyed at least once every 5 years. However, only a 1-year protocol survey is required, compared to the previous 2-year survey requirement. For example, if a flycatcher protocol survey was completed in 2009, flycatcher surveys would not be needed in 2010, 2011, 2012, or 2013, but a 1-year resurvey would be needed in 2014, completing the 5-year cycle for periodic resurveys of suitable flycatcher habitat patches. Following the 2014 survey season, no flycatcher surveys would be needed in 2015, 2016, 2017, or 2018, but a 1-year resurvey would be required in 2019 to maintain compliance with the ESA. This schedule would meet the USFWS's requirement for a 1-year resurvey every 5 years to check for possible occupancy of suitable flycatcher habitat within a landscape of ongoing livestock grazing during the operation of a 10-year term grazing permit.

If surveys detect flycatchers during the breeding season, the USFWS should be contacted to determine the appropriate periodicity for monitoring efforts, but surveys would likely be conducted once every 3 years, instead of once every 5 years. If habitat monitoring showed that suitable flycatcher habitats were not being maintained in a stable or upward trend, the USFWS should be contacted to discuss if changes in livestock management practices is necessary and determine if more frequent surveys are needed.

**Survey Protocol:** For project-specific clearance surveys, the current flycatcher survey protocol requires a total of five surveys be conducted across the survey season, with individual surveys separated by a minimum of 5 days. The protocol calls for one survey in the first survey period, at least one survey in the second survey period, and third surveys in the third survey period.

At higher-elevation sites on the SJNF (sites typically above 8,500 feet), access to survey sites is sometimes not possible until after the end of the first flycatcher survey period due to roads remaining blocked by remaining winter snow. In these cases, the first survey period may be skipped, but surveys should begin as soon as access to the site is possible. In these cases, two surveys should be done during the second survey period and three surveys done in the third survey period, again with individual surveys separated by a minimum of 5 days.

If surveys are being done for the purpose of "clearing" a proposed project in or near suitable flycatcher habitat, then all five surveys should be completed during the survey season. If surveys are being done for the purpose of periodically checking to see if flycatchers have occupied suitable habitat then three surveys are sufficient for the purpose of a general occupancy inventory. But in this case, at least two surveys should be completed in the second survey period and at least one survey should be completed in the third survey period.

Land and Resource Management Plan Leasable Minerals Stipulations: The following lease stipulations would be applied to minerals and energy leases where southwestern willow flycatcher habitat is present.

## Timing Limitation

**No surface use is allowed during the following time period(s):** May 1 to August 15 in mapped suitable nesting habitat.

For the purpose of: Prevent disruption of reproductive activity during the production period.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the USFWS, may grant an exception if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current of subsequent nest attendance, egg/chick survival, or nesting success. Seasonal time frames may be modified if operations could be conditioned to not disrupt current or subsequent breeding behavior and bird distribution within suitable breeding habitat.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

## No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** Within 325 feet of the ordinary high water mark in mapped habitat.

For the purpose of: Prevent disruption of reproductive activity in mapped habitat.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer in consultation with the USFWS, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect current or subsequent suitability or utility of riparian habitat suitable for the southwestern willow flycatcher.

**Modifications:** The Authorized Officer in consultation with the USFWS, may modify the configuration of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is currently and subsequently nonessential to the function and utility of riparian habitat, or that the Proposed Action could be conditioned so as not to impair the utility of habitat for the southwestern willow flycatcher.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Cumulative Effects**

The southwestern willow flycatcher's current range is believed to be similar to its historical range, but the quality and quantity of habitat has been significantly reduced causing habitat to be less common and more isolated (USFWS 2004). Thus, the primary cause of the flycatcher's decline is loss and modification of habitat (USFWS 2002a). Historically, these habitats have always been dynamic (i.e., habitat size and location evolve over time) due to natural disturbance and regeneration events such as floods, fire, and drought. With increasing human populations and the related industrial, agricultural, and urban developments, these habitats have been further modified, reduced, and eliminated by various mechanisms (USFWS 2002a).

Human influences on local riparian habitats on the SJNF and southwest Colorado have historically been similar to those described elsewhere throughout the range of the southwestern willow flycatcher. Although riparian zones are protected by various laws and regulation, pressures on these systems on public and/or private land can be expected to continue. The influence of past and current cumulative effects on riparian willow systems on public lands is expected to lessen as riparian areas receive greater management attention and continue to improve over time. Potential cumulative effects on willow flycatcher habitat on private lands can be expected to continue and perhaps increase as human development pressures and other activities increase.

#### **Determination**

Willow carrs and other riparian systems are recognized in the LRMP for their limited distribution and unique ecological values. As such, there are numerous conservation measures and standards and quidelines to protect, maintain, and improve these features. These include an NSO fluid minerals leasing stipulation for southwestern willow flycatcher habitat, guidance found in Region 2 Watershed Conservation Practices Handbook (Region 2 FSH 2509.25-2006-1), and additional standards and quidelines found mainly in the Terrestrial Wildlife, Riparian Area and Wetland Ecosystems, Aquatic Ecosystems and Fisheries, Water Resources, and Livestock and Rangeland Management sections of the LRMP. The contained direction addresses hydrology, soils, and vegetation health for maintaining or improving functionality and riparian habitat throughout the SJNF, including that suitable for the flycatcher. The application of the conservation measures/standards and guidelines in the LRMP are expected to avoid any direct habitat loss of willow or other riparian systems, as well as minimize potential indirect effects. Consultation for management of the one occupied site has occurred. Extensive surveys have been completed across the planning unit with no additional observations. If additional occupation or nesting is identified elsewhere, consultation would be initiated. Other indirect influences mentioned as potential risk factors to the species, such as nest parasitism of by brown-headed cowbirds, have not been documented on the SJNF and are currently not considered a local management concern. With application of LRMP standards and guidelines, and conservation measures described above. management actions associated with the Preferred Alternative may affect but are not likely to adversely affect southwestern willow flycatcher or its habitat.

# Mexican Spotted Owl (Strix occidentalis lucida)

# **Background**

The Mexican spotted owl is one of three recognized subspecies of spotted owl. The Mexican subspecies is geographically isolated from both the California and northern subspecies. Studies suggest that the Mexican spotted owl is genetically isolated from the other subspecies (Barrowclough and Gutiérrez 1990; see also Funk et al. 2008). It has the largest range of the three spotted owl subspecies, extending north from Mexico through the mountains of Arizona, New Mexico, and west Texas into the canyons of Utah and south and west Colorado.

In 1993 the USFWS listed the Mexican spotted owl as threatened under the ESA (USFWS 1995a). Critical habitat for Mexican spotted owl was designated in 2004 on federal lands in Arizona, Colorado, New Mexico, and Utah. No critical habitat is designated on the SJNF. The Mexican spotted owl was also state listed as threatened by CPW in 1993.

The Mexican spotted owl inhabits coniferous mixed woodlands in isolated mountain ranges and canyon lands of the southwestern United States and into Mexico (USFWS 2012b). The Mexican spotted owls range is fragmented, occupying isolated mountains and canyon lands, and it is believed that the historic and current range is similar. The 2012 Mexican Spotted Owl Recovery Plan divides the species' range into five Ecological Management Units (USFWS 2012b).

Mexican spotted owls consume a wide variety of prey throughout their range. Feeding primarily at night, they feed on small to medium-sized rodents such as deer mice (*Peromyscus* sp.), voles, and the larger woodrats (*Neotoma* sp.). They would also catch flying prey such as birds and large insects.

The reasons for listing under ESA are discussed in the recovery plan and fall within five categories:

- A. Present or threatened destruction, modification, or curtailment of habitat or range.
- B. Overutilization for commercial, recreational, scientific, or educational purposes.
- C. Disease or predation.
- D. Inadequacy of existing regulatory mechanisms.
- E. Other natural or human-made factors affecting the species' continued existence.

Appendix C of the 2012 Mexican Spotted Owl Recovery Plan (USFWS 2012b) provides management recommendations for addressing these five categories.

## Status and Distribution on the San Juan National Forest

Based on habitat definitions in the 2012 recovery plan and subsequent consultation with the USFWS, an updated habitat model was used to in the first quarter of 2013 to determine habitat across the SJNF. Previous surveys, since the late 1980s to determine occupation, have covered 22% of the habitat identified under the current Mexican spotted owl habitat model for the SJNF. Despite extensive surveys, only two verified juvenile females, one verified juvenile male, and one probable detection of an individual have occurred on the SJNF. All have been in the lower elevations of the southeast portion of the SJNF within steep canyons containing mature mixed conifer vegetation. These detections may represent dispersing or migratory individuals. Surveys have not identified any nesting pairs or reproductive activity on the SJNF. The closest known nesting is located south of the SJNF in and around Mesa Verde National Park within deep canyon country with mature mixed conifer vegetation. The occurrence of Mexican spotted owl on the SJNF appears to be incidental and uncommon, and similar to other locations in Colorado, where apparently suitable habitat remains unoccupied. As no populations occur on the SJNF, no population trends can be established. The current information suggests that the SJNF does not measurably contribute to the recovery or overall viability of the Mexican spotted owl. The recovery plan shows no designated critical habitat essential for the conservation of the species and necessary to support recovery on the SJNF. The recovery plan also states that observations of birds on the SJNF are considered transitory. No protected activity centers related to critical life function are designated on the Forest. The observed birds are not considered part of a breeding population on SJNF, contributing to the maintenance and recovery of populations. The possibility of future individual breeding pairs; however, cannot be discounted as the recovery of this subspecies expands.

# Habitat for Mexican Spotted Owl across its Geographic Range

Throughout its lifetime, a Mexican spotted owl would use a variety of habitats to meet different life-history needs. To maintain a diversity of habitat types for the various activities of the owl, key habitat variables are required. These include nesting, roosting, and foraging habitat patches with structural, compositional, and successional diversity, as well as connectivity among suitable patches. Specifics regarding key habitat variables are found in the Recovery Plan, Appendix C, describing desired conditions.

Mexican spotted owls have been observed to nest, roost, forage, and disperse among a wide array of biotic communities, the owl is typically considered a "habitat specialist" in that roost and nest habitats generally occur in late seral forests or rocky canyon habitats. Some Mexican spotted owls undergo altitudinal migrations during winter to areas where habitat structure and composition differ from that used during breeding (USFWS 2012b). Dispersing juveniles can occur in a wide variety of habitats, including mixed conifer forests, pinyon-juniper woodlands, and riparian areas surrounded by grasslands.

Mexican spotted owl habitat is limited by the availability of nesting and roosting habitat (Ganey and Balda 1994). Territories consist of a core of mature or late successional mixed conifer forest or steep, narrow, rocky canyons for nesting and roosting. These stands are typically on steep, north-facing slopes with complex structures including high snag and downed wood densities and very high canopy closures (USFWS 2012b). The Recovery Plan uses 43 hectare (100 acres) as minimum patch size for nesting and roosting habitat within a minimum 600-acre protected activity center.

The proposed rule to designate critical habitat for the Mexican spotted owl was completed by the USFWS in February 2001. That proposal included 4.6 million acres across Colorado, Utah, Arizona, and New

Mexico. The 2001 proposal was considered inadequate by the courts in October 2003, and a new final rule to designate critical habitat was published in August 2004. The 2004 rule included 8.6 million acres across federal lands in Colorado, Utah, Arizona, and New Mexico. Approximately 322,326 acres (3.7%) of this land occurs in Colorado. The SJNF was not included in the 2001 nor the 2004 critical habitat designations.

#### Habitat on the San Juan National Forest

The SJNF is split between the Colorado Plateau and the Southern Rockies Ecological Management Units. No protected activity centers have been designated on the SJNF. Recovery habitat on the SJNF is almost identical for both Ecological Management Units and differs slightly in the composition of some canyon habitats. The SJNF mapped areas of Mexican spotted owl recovery habitat, where data are available, using habitat criteria developed in cooperation with the USFWS. These criteria include mature mixed conifer vegetation on slopes of greater than 40%, with 40% to 70% and above crown closure. Adjacent bottoms to these habitats that also contain these mature forest types can be considered recovery habitat. There are limited narrow, rocky canyons occurring on the SJNF. It is thought that where this vegetation condition occurs within narrow rocky canyons, that this would represent the more suitable habitat conditions on the SJNF. Also, the upper portions of some side canyons originating along the main Dolores River canyon reach NFS lands along the western boundary. These habitat types are also considered recovery habitat, although suitability of habitat across the SJNF is generally considered marginal (Charles Johnson, personal communication 2003). A reliable inventory of the slot canyons and side canyons of the Dolores River are not available for the SJNF. GIS queries would capture a portion of these when the forested or canyon component is present in large enough areas to be captured in the GIS database. Some isolated sites suitable for nesting may only be identified during project-level ground surveys as the specific criteria producing an isolated microclimate conducive for nesting may not occur in areas large enough to be identified by a GIS habitat model exercise. These areas are identified through on-the-ground habitat evaluation that occurs during project-level analysis for proposed management actions.

GIS queries have modeled the forested categories of recovery habitat for the SJNF. In total, 65,511 acres of habitat were mapped throughout the SJNF. These areas represent approximately 3% of the total acreage on the SJNF. Habitat trend analysis show minor changes, less than 1%, to this habitat type (mature 4B and 4C mixed conifer) across the entire landscape since the inception of the first LRMP in the early 1980s.

The Mexican spotted owl utilizes a wide variety of habitat types throughout its range. The USFS and USFWS are currently cooperating to better define recovery habitat characteristic specifically occurring on SJNF. The recovery plan is adopted in the LRMP revision for providing guidance for management activities occurring on the SJNF. This and continued monitoring and maintenance of occupied habitats, if identified, are the primary conservation measures that the SJNF would utilize to aid in the recovery of this species.

Most of the existing Mexican spotted owl habitat on the SJNF is located in protected areas, which include CRAs (33,888 acres), designated wilderness and the Piedra Area (16,483 acres), and RNAs (29 acres). Additionally, there are 240 acres in the Chimney Rock National Monument, which will have limited management that would affect Mexican spotted owl habitat. Approximately 14,871 acres of habitat are not within a protected area. Very few projects/activities have occurred in protected areas. Those that have occurred include prescribed burning (Piedra Area and Hermosa area), vegetation management (Chimney Rock National Monument), and livestock grazing. Livestock grazing has occurred in most protected areas except Chimney Rock National Monument, which is closed to grazing. Limited grazing has also occurred in designated wilderness and RNAs. Projects that have occurred outside protected areas include mechanical vegetation treatments, recreation, and livestock grazing.

Although management activities have occurred in Mexican spotted owl habitat, their occurrences have been small in scale and have not resulted in adverse impacts to habitat. The largest influences to owl habitat have resulted from fire suppression, wildland fires, and insects and disease. Existing Mexican spotted owl habitat at the only known occupied owl site on the SJNF has been negatively affected by

insects and disease. Monitoring at the site has shown structural changes to mixed conifer habitat located on the north-facing steep slopes in and outside canyons. There has been an increase in mixed conifer mortality (primarily Douglas-fir) resulting from insect and disease activity. There are numerous dead and dying Douglas-fir trees of all age classes on north-facing slopes. In these areas, downfall is extensive, and in other areas, the open canopy has created favorable growing conditions for mixed shrub species. These declining habitat conditions have degraded habitat for Mexican spotted owl, likely affecting occupancy at the site, and increasing the vulnerability of the area to severe wildland fire. The site has remained unoccupied by Mexican spotted owl for the last 5 years.

Wildfires are a very common occurrence across the SJNF. Wildfire occurrences have resulted from natural ignitions and, to a lesser extent, caused by humans either intentionally or unintentionally. Approximately 5,000 acres of Mexican spotted owl habitat were influenced by wildfires from 2000 to 2012. The vast majority of the habitat burned resulted from the Little Sand Fire of 2012 and Missionary Ridge Fire of 2002. Effects to habitat from these fires have not been quantified, as the areas burned were not classified as habitat for Mexican spotted owl prior to the recent mapping effort. General observations of the burn areas have shown areas of high-intensity fire, and areas of low- to moderate-intensity fire. The overall effects to habitat have been positive and negative as described below.

Existing recreational use in Mexican spotted owl habitat is limited, and therefore potential effects on Mexican spotted owl from recreationists are expected to be minimal. There are limited designated roads and designated trails (summer or winter) in Mexican spotted owl habitat. Additionally, there are no developed recreation sites in owl habitat. Portions of habitat that may contain roads or trails would include the well-developed open riparian bottoms, adjacent to suitable nesting habitat that owls could utilize for foraging and/or roosting habitat. Where engineering allows for stability and ecological sustainability, limited roads may exist through some steep slope mature mixed conifer habitat, but would be considered unusual on the SJNF. No system roads or trails are located within the narrow slot canyon habitat, which is considered the most suitable habitat for the owl on SJNF (Charles Johnson, personal communication 2003). Most of the owl habitat across the SJNF is in areas that receive limited use by recreationists because of the remote nature and rugged topography making access difficult. Use that does occur is limited to hiking, with most hiking occurring during the spring and fall turkey hunting season, late summer/early fall small game seasons, and fall big game hunting seasons. Occasional use occurs outside hunting seasons but is generally minimal.

## **Direct and Indirect Effects**

The Mexican Spotted Owl Recovery Plan identifies listing factors/activities influencing Mexican spotted owl across its range (USFWS 2012b). These factors were identified in the background section. Their relationship to and/or influences from the LRMP's Preferred Alternative are discussed below.

Actions proposed under the Preferred Alternative are not likely to contribute to Factor B, overutilization of commercial, recreational, scientific, or educational purposes. Mexican spotted owl occurrence and occupancy across the SJNF is very limited. The lack of Mexican spotted owl populations minimizes risk from activities associated with Factor B.

Actions proposed under the Preferred Alternative are not likely to contribute to Factor C, disease and predation. The final rule for listing implied that forest management created transition habitats (i.e., ecotones) favored by great horned owls (*Bubo virginianus*), thus creating an increased likelihood of contact between the two. The Preferred Alternative adopts management recommendations in the Mexican Spotted Owl Recovery Plan, which provides guidelines for minimizing impacts to habitat from actions such as vegetation treatments that create transition habitats predisposing the species to predation.

Actions proposed under the Preferred Alternative are not likely to contribute to Factor D, inadequacy of existing regulatory mechanisms. The Preferred Alternative adopts management recommendations in the recovery plan, which provides guidelines for minimizing impacts to Mexican spotted owl habitat from a variety of land use activities. The extent of various land use activities proposed under the Preferred Alternative are described below.

Actions proposed under the Preferred Alternative are not likely to contribute to Factor E, other natural or human-made factors affecting the species' continued existence. This factor identifies several threats to the Mexican spotted owl such as the potential for increasing malicious and accidental anthropogenic harm to the species and potential for barred owl to expand its range into that of Mexican spotted owl habitat resulting in potential competition and/or hybridization. Presently, Mexican spotted owl occurrence on the SJNF is very limited. The lack of known occurrences minimizes the risk of malicious and accidental anthropogenic harm to the species. Barred owls are currently not present on the SJNF, and their presence in Colorado is rare, therefore minimizing risk of competition and hybridization.

Federal actions affecting Mexican spotted owl fall primarily within Factor A, present or threatened destruction, modification, or curtailment of habitat or range. Factor A includes activities/risk factors such as stand-replacing fire, fire suppression, burned area response, WUI treatments (discussed under Fire and Fuels Management below), silvicultural treatments (discussed under Timber Management below), insects and disease, livestock grazing, energy development, roads and trails, land development, recreation, and water developments. These activities may not necessarily be threats per se, depending on their level of intensity, duration, or geographic extent (USFWS 2012b). The analysis of direct and indirect effects focuses on activities/risk factors identified under Factor A.

**Stand-replacing Fire:** Human-managed alteration of forests in the southwestern United States has resulted in extensive areas of Mexican spotted owl habitat that are now more vulnerable to the effects of stand-replacing wildland fires (USFWS 2012b). Current forest conditions in Mexican spotted owl habitat across the SJNF have the potential to sustain landscape-scale stand-replacing fires that would positively or negatively alter owl habitat over extensive areas in a single fire incident, depending on certain conditions. As described in the recovery plan, the extent of any positive or negative effects would depend on whether the fire and/or suppression activities are within owl habitat, type of habitat involved (e.g., nest/roost, foraging, dispersal habitat), severity and intensity of the wildland fire, areal extent, location, intensity of suppression activities, frequency and cumulative effects of the suppression activities, and time of year.

Direct and indirect fire effects to Mexican spotted owl habitat from stand-replacement fire include the alteration of vegetation structure, soil, and watershed conditions. These effects can be detrimental, beneficial, or both depending on the factors listed above. The evaluation of effects is also dependent on temporal scale; effects that are detrimental in the near term may have long-term beneficial effects. Conversely, fires may provide short-term benefits, but result in stand degradation over time. The fire-severity class is directly related to the magnitude of these effects, and it also influences whether such effects are positive or negative on owl habitat. High-severity burns have the most negative long-term effects on spotted owl nest and roost habitats but could enhance foraging habitats used by owl prey species (e.g., woodrats or deer mice) (Franklin et al. 2000; Kyle and Block 2000).

The Preferred Alternative includes management actions such as prescribed burning and mechanical vegetation treatments that would help minimize risk of stand-replacement wildfire. Treatments may occur in and adjacent to Mexican spotted owl habitat. Priority areas for mechanical vegetation treatments would include the WUI where communities are at risk to fire, where fires are a greater threat to people and property, and where fire applications have much greater risk and liabilities. In most WUI areas, fire regime and vegetation structure and composition have been moderately to substantially altered, representing Fire Regime Condition Classes 2 and 3. Many of the identified WUI areas also coincide with big game winter range habitat and habitat for Mexican spotted owl.

**Fire Suppression:** Varying levels of fire suppression activities have occurred across the SJNF since it was proclaimed in 1905. Suppression efforts coupled with other management actions such as historic timber harvest and livestock grazing have altered forest conditions, thereby increasing the risk of high-intensity wildfire. The SJNF continues to manage wildland fire using appropriate management response strategies which may include full suppression actions to initiating limited suppression such as the case when managing fires for resource benefits under the wildland fire use program.

Regardless, of the suppression actions taken, suppression activities can result in habitat loss through building of firelines, construction of support areas such as helipads and fire camps, and ignition of

backfires and burnouts to reduce the amount of fuel available to wildland fires. Whether the habitat effects of fire-suppression activities cause more or less impact to Mexican spotted owl habitat than the benefits gained by controlling the fire can only be determined site specifically, and then only to the extent that with-suppression and without-suppression scenarios can be accurately evaluated (USFWS 2012b). The SJNF has and would continue taking actions to reduce suppression impacts to federally listed species by assigning resource advisors to incident management teams. Resource advisors provide input to help reduce impacts to listed species and their habitats.

**Burned Area Response:** Emergency stabilization and burned area rehabilitation treatments are applied to stabilize and rehabilitate burned areas so they can recover more rapidly (USFWS 2012b). Methods of emergency stabilization and burned area rehabilitation include aerial mulching and seeding, tree planting, and construction of water/soil control structures (e.g., gabions, water bars, and straw bales). From a habitat standpoint, these activities are probably beneficial to Mexican spotted owl in that they provide protection of soils, thereby reducing the likelihood of permanent soil loss in preparation for longer-term rehabilitation efforts. Use of non-native species, however, for post-fire seeding is often ineffective at meeting management objectives and may have long-term implications on forest ecology (Peppin et al. 2010 cited in (USFWS 2012b).

The SJNF has and would continue to conduct emergency stabilization and burned area rehabilitation treatments for wildfires for resource recovery. As described above under fire suppression, resource advisors are usually assigned to assist with emergency stabilization and burned area rehabilitation treatments, providing input designed to reduce impacts to federally listed species.

Fire and Fuels Management: The Mexican Spotted Owl Recovery Plan lists a primary threat to Mexican spotted owl population in the United States as an increased risk of stand-replacing wildland fire. It also recognized that climate change conditions in the southwestern United States compound that risk of standreplacement fires within Mexican spotted owl habitat. Recent forest management, including the LRMP. now emphasizes sustainable ecological function and a return toward pre-settlement fire regimes, both of which are more compatible with maintenance of spotted owl habitat conditions than the even-aged management regime practiced at the time of listing, and being consistent with strategies outlined within the recovery plan. The LRMP identifies large landscapes, much within or adjacent to Mexican spotted owl habitat, which are currently susceptible to stand-replacement fire in need of fuels treatment to move habitat toward desired conditions more representative of HRV. Conditions resulting from strict fire exclusion management of the twentieth century are a factor leading to current condition outside of HRV and the resulting risk of loss of suitable condition to Mexican spotted owl habitat function on the SJNF. Under the Preferred Alternative, approximately 6,000 acres of hazardous fuels would be treated annually via prescribed fire in vegetation types that are within or adjacent to Mexican spotted owl habitat. Mechanical treatments would constitute approximately 7,000 acres of the annual hazardous fuels treatments, also in vegetation types that are within or adjacent to Mexican spotted owl habitat. In total, approximately 90,000 acres of prescribed burning and approximately 105,000 acres of mechanical vegetation treatments may occur in vegetation types that are within or adjacent to Mexican spotted owl habitat over the life of the LRMP.

Naturally ignited wildland fire, managed for resource benefits, may occur up to 60,000 acres annually in mixed vegetation types that are within or adjacent to Mexican spotted owl habitat. Use of managed fire, along with mechanical and other fuels management strategies, is expected to create forest conditions that meet desired conditions for the natural vegetation types within the planning area. The use of prescribed fire through application of ground or aerial ignition methods is expected to continue in Mexican spotted owl habitat under the Preferred Alternative. Prescribed burns would occur during early spring or fall when conditions are favorable to meet desired project burn plan objectives. Summer burns are possible in areas where prior treatments (mechanical or prescribed fire) have occurred and conditions are favorable to reduce risk of high-intensity fire.

Prescribed burning in Mexican spotted owl habitat would generally occur on mesas, in canyons, and in steep-slope mixed conifer. Low- to moderate-intensity understory burns are expected, resulting in the consumption of leaf and needle litter, down and dead woody debris, and small-diameter trees and shrubs. Burning would reduce surface fuel loading and the "ladder effect" that results from fire moving into the

crowns of trees due to fuel build-up (small trees, shrubs, and litter) beneath the crowns. Torching of individual trees or groups of trees and some scorching of trees due to fuel loading and potential heat build-up under individual or groups of trees is expected. The torching and scorching of individual or groups of trees has potential to affect roosting habitat. Burning would also consume down and dead course woody debris and some snags, all habitat components utilized by prey species. Direct impacts to owl habitat and habitat components utilized by prey species are expected to be minimal due to burn prescription parameters and treatment objectives. Overall, suitable Mexican spotted owl habitat is not expected to be converted to an unsuitable condition.

Approximately 20,290 acres or 31% of Mexican spotted owl habitat on the SJNF is located in the WUI. Mechanical vegetation treatments in the WUI would focus on thinning primarily small to mid-sized trees in project areas to break-up fuel continuity and to reduce the ladder effect of fuels as described previously. The resulting stand structure and general appearance would be more open, with small openings interspersed within clumps of mature and older trees.

Wildfires that result from natural ignitions (lightning) would be managed under the SJNF's wildland fire use program where fires are managed for resource benefits. These fires are a primary means for restoring natural disturbance processes and are likely to occur in or adjacent to Mexican spotted owl habitat. Effects to owl habitat from wildland fire use are expected to be similar to prescribed fire described above, but likely occurring across a larger scale. ESA Section 7 emergency consultation may be initiated with the USFWS where discretionary actions are taken that effect Mexican spotted owl or habitat when managing natural ignitions. In some instances, the construction of line via hand or mechanical equipment may be necessary to help confine or contain the fire to pre-established management boundaries, potentially affecting habitat as described above.

Mexican spotted owl protocol surveys described in the recovery plan would be conducted prior to prescribed fire and mechanical vegetation treatments to determine owl occupancy and potential breeding activity in project areas. Treatments would be consistent with fire and fuels management recommendations in the recovery plan. Effects from burn activities would be evaluated and Section 7 consultation would be initiated with the USFWS to ensure consistence with the recovery plan.

**Timber Management:** Under the Preferred Alternative, timber harvesting may occur across approximately 707,616 acres of the SJNF. These acreages include lands that are suitable for timber production and other tentatively suitable lands where non-commercial timber harvest may occur. Of the total, approximately 2,004 acres or 3% of Mexican spotted owl habitat are in lands identified as suitable for timber production. Approximately 20,417 acres or 31% of Mexican spotted owl habitat occur in other lands tentatively suitable for timber harvest. Timber harvest may occur on these lands for purposes other than for timber production, but is not scheduled or regulated. The remaining approximately 43,090 acres of habitat are in lands that are generally not suitable for timber production.

Under the Preferred Alternative, approximately 500 acres of warm-dry mixed conifer may be treated annually over the life of the LRMP (approximately 15-year period), which includes 250 acres via restoration treatment and 250 acres via partial cutting. Additionally, approximately 125 acres of coolmoist mixed conifer may be treated annually via partial cutting. In total, approximately 9,375 acres of mixed conifer habitat may be treated over the life of the LRMP via timber management across the SJNF. At this time, site-specific information is not available and the portion of the treatment areas that may comprise Mexican spotted owl habitat are not determined at this programmatic level of planning.

Timber outputs associated with the Preferred Alternative are expected to have minimal influence to Mexican spotted owl habitat. Direct and indirect effects to stand structure are expected to be similar to those described for fuels treatments. Ponderosa pine and warm-dry mixed conifer forests currently have less acres in both young and old growth structural stages compared to HRV conditions. Other timber types also vary from HRV condition for various structural stages. In the recovery plan, managing for habitat perpetuity into the future is listed as one of the five key elements designed to conserve the subspecies throughout its range. Where suitable on the planning landscape, harvest for either timber production or for purposes other than timber production, would be designed to meet the needs for habitat sustainability. These are described under the LRMP in the Ecological Framework and the Conservation

of Species and the Terrestrial Ecosystems and Plant Species sections, which include direction for providing and maintaining sustainable habitat structural stages of timber types and assure that suitable habitat structural stages are maintained and replaced through successional processes, including harvest. These harvest amounts are designed to move these habitat types toward HRV condition and are consistent with the recovery plan design to provide habitat for the species over the long term. We are unable to quantify total acreage of habitat treated under the Preferred Alternative; however, only 3% of the habitat is suitable for timber production. Treatment in suitable areas is expected to be limited as habitat is largely located on steep slopes and in rugged terrain, areas generally not conducive for harvest equipment. Potential timber harvest in other lands tentatively suitable for harvest would likely result in fewer impacts to habitat as treatment is more restricted (must occur in order to meet other desired conditions and resource objectives, as opposed to production). Timber management can affect Mexican spotted owl and its habitat both positively or negatively depending on project design and site-specific factors. Timber management in owl habitat would be consistent with recommendations in the recovery plan and with additional LRMP components designed to move habitat toward HRV condition, maintain or improve habitat suitability for Mexican spotted owl, and reduce the threat of stand-replacing wildfire potential. Effects from timber management actions in Mexican spotted owl habitat would be evaluated under site-specific analysis, and Section 7 consultation would be initiated with the USFWS to ensure compliance with the recovery plan.

**Insects and Disease:** Insect and disease aerial detection data from the USFS Rocky Mountain Region Forest Health Management Program show approximately 16,970 acres of Mexican spotted owl habitat have been influenced by insects and disease from 2007 to 2011. These data depict the occurrence and location of forest insect, disease, and other biotic and abiotic causes of tree mortality and tree damage. Aerial survey data are collected by observing areas of tree damage or tree mortality from an aircraft and manually recording the information onto a map. Due to the nature of aerial surveys, these data can only provide rough estimates of location, intensity, and the resulting trend information for agents detectable from the air.

Native forest insects and diseases are natural ecosystem processes with which the Mexican spotted owl has evolved. The influences of these ecosystem processes on owls can be either negative or positive, depending on intensity and extent, both within and among forest-pathogen types (USFWS 2012b). Native insects and disease likely are an issue for owl habitat only when they reach epidemic levels. Insects and disease of primary interest in Mexican spotted owl habitat on the SJNF include Douglas-fir beetle (*Dendroctonus pseudotsugae*), fir engraver beetle (*Scolytus ventralis*), western spruce budworm (*Choristoneura occidentalis*), Douglas-fir pole beetle (*Pseudohylesinus nebulosus*), root rot (*Armillaria ostoyae*), white trunk rot (*P. tremulae*), fir broom rust (*Melampsorella caryophyllacearum*), annosus root rot (*Heterobasidium annosum*), and Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*). Insects and diseases, while naturally occurring, can pose some risk to Mexican spotted owl when they involve exotic species or when native-species infestations are exacerbated by unnatural stand conditions, drought, climate change, or other factors. If the range of the owl becomes hotter and drier, insect and disease outbreaks can be expected to increase in frequency, extent, intensity, and duration (USFWS 2012b).

As mentioned earlier, insects and disease have affected habitat occupied by Mexican spotted owl on the SJNF. These activities have degraded habitat for Mexican spotted owl, and could have contributed to the only known occupied site being vacated by owls. The Preferred Alternative includes management actions that would help address forest health concerns related to insects and disease; however, the potential still exists for continued impacts to owl habitat from insect and disease. Native insects and disease play a role in ecological functioning and are not usually considered a problem when found at normal endemic levels. Currently, varying species of bark beetle are spreading at epidemic rates in the western states, including the SJNF, killing trees within particular age classes within varying life zones. Where a disproportionate percent of the forest consists of the vulnerable tree species and age classes, large portions of that age class may be affected. The current rate of spread on the SJNF is being attributed mainly to the compounding factors of climate change and extended drought. The LRMP direction takes a sustainable ecological function approach and is focused on providing long-term healthy forest conditions, which are more resistant to outbreaks and their resiliency for recovery and for minimizing the extent of new outbreaks. Commodity uses, such as timber production, must fit within the LRMP constraints and

contribute to the ecological framework set up in the Ecological Framework and Conservation of Species section of the LRMP and within the latter sections such as Terrestrial Ecosystems and Plant Species. This is achieved by managing for balanced ecological representation of tree species and age classes which fit within the HRV conditions. These changes are not instantaneous on the landscape and require long-term planning to achieve the desired conditions, especially where current condition varies significantly from those conditions found under HRV. Managing for recovery habitat into the future is one of the five key elements of the recovery strategy designed to conserve the subspecies throughout its range. The LRMP and its direction concerning disease and insects are consistent with the guidelines for disease and insects listed within the Mexican Spotted Owl Recovery Plan.

**Livestock Grazing:** The Preferred Alternative designates where livestock grazing can occur on suitable lands across the SJNF. Suitable lands are lands that have been determined to have adequate productivity for domestic livestock, while meeting forage needs for wildlife. Areas suitable for cattle and horse grazing exist on approximately 666,160 acres. Areas suitable for domestic sheep and goat grazing exist on approximately 76,921 acres. Of the areas suitable for cattle and horse grazing, approximately 10,902 acres contain Mexican spotted owl habitat, of which approximately 6,655 acres or 61% are within active or vacant allotments. Of the areas suitable for domestic sheep and goat grazing, approximately 20,363 acres are in Mexican spotted owl habitat, of which approximately 9,941 acres or 49% are in active or vacant allotments.

Effects to Mexican spotted owl from grazing by domestic livestock and wild ungulates are complex, and multiple factors may determine specific influences. These factors include local and regional climatic patterns, biotic community associations and ecology, soil types and conditions, and the timing, intensity, and duration of vegetation removal associated with the presence of grazing animals (USFWS 2012b). Although the effects of grazing on Mexican spotted owl are complex, they generally fall into two categories: 1) those that result in relatively short-term effects requiring short recovery periods to restore suitable habitat characteristics, and 2) those that result in long-term alterations in plant species composition and vegetation structure (USFWS 2012b). Grazing by domestic livestock and wild ungulates is a potential threat to Mexican spotted owl when managed insufficiently, with respect to effects on prey species habitat (e.g., reducing herbaceous ground cover), nest/roost habitat (e.g., limiting regeneration of important tree species, especially in riparian areas), and the capacity for resource managers to restore and maintain conditions supporting natural fire regimes within an array of habitat types.

Grazing by domestic livestock and wild ungulates on the SJNF is prevalent and reoccurring in most Mexican spotted owl habitat. The level of grazing is limited due to the overall lack of preferred grass-forb forage in closed canopy, steep-sloped mixed conifer owl habitat. Livestock generally prefer open habitats that support an abundance of forage species. Steep slopes and closed canopy of mature timber stands utilized by Mexican spotted owl as nesting and brood rearing habitat provide little livestock forage and are utilized and impacted minimally by livestock. Areas suitable for livestock use, which overlap with Mexican spotted owl habitat, consist of more open areas which support livestock forage species and subsequently support prey species and foraging habitat for the Mexican spotted owl. There are a number of conservation measures represented in standards and guidelines for range management and ecological sustainability, as well as other referenced guidance, including agency manual and handbook direction and the Mexican Spotted Owl Recovery Plan direction. This is expected to provide for healthy ecosystem. conditions where managed livestock use would additionally provide for conditions that support Mexican spotted owl forage species. Grazing under the Preferred Alternative is not expected to have adverse impacts to owl habitat based on current grazing intensities (low to moderate) in owl habitat. Grazing management recommendation from the Mexican Spotted Owl Recovery Plan would be applied to grazing activities occurring across active/vacant livestock grazing allotments. The application of grazing recommendations is expected to reduce livestock grazing impacts to Mexican spotted owl under the Preferred Alternative.

**Energy Development:** Under the Preferred Alternative, the most common of forms of energy development include oil and gas leasing and development. The SJNF is not a priority area for other energy development such as wind or solar energy. Under the Preferred Alternative, approximately 1,301,352 acres of NFS lands are available for oil and gas leasing. Designated wilderness areas and the

Piedra Area are areas withdrawn from leasing by law. Additionally, approximately 67,700 acres are recommended for wilderness and WSR designation and are administratively not available for lease.

The Preferred Alternative incorporates a number of lease stipulations that guide how potential development could occur across areas leased areas. Lease stipulations are applied to protect various resources (soils, watersheds, terrestrial and aquatic wildlife and habitat, cultural resources, etc.) from adverse impacts from development activities. Roadless areas have an NSO stipulation, and for lands outside roadless areas, a full range of leasing stipulations are assigned including NSO, TL, CSU, and standard lease terms to protect various resources.

Of the total area available for lease, approximately 40,717 acres are present in Mexican spotted owl habitat, as modeled. The different types of leasing stipulations are not mutually exclusive on any one piece of land and may, in fact, overlap on top of each other. Of the total habitat acreage leased, an NSO stipulation has been applied across 35,130 acres (86%), a CSU stipulation has been applied across 28,522 acres (70%), a TL stipulation has been applied across 9,782 acres (24%), and standard lease terms apply across approximately 968 acres (2%) of the habitat.

Under the Preferred Alternative, areas with high potential for prospective oil and gas development include the GSGP area, the Northern San Juan Basin, the San Juan Sag, and the Paradox Basin.

Approximately 2,531 acres of Mexican spotted owl habitat are present in the GSGP area. Of the total habitat present in the GSGP area, approximately 2,067 acres are available for lease, of which 1,786 acres (86%) include an NSO stipulation, 575 acres (28%) include a CSU stipulation, 103 acres (5%) include a TL stipulation, and standard lease terms apply across 65 acres (3%).

Approximately 1,905 acres of Mexican spotted owl habitat are present in the Northern San Juan Basin area. Of the total habitat present in the Northern San Juan Basin area, approximately 1,681 acres are available for lease, of which 1,435 acres (85%) include an NSO stipulation, 420 acres (25%) include a CSU stipulation, 789 acres (47%) include a TL stipulation, and standard lease terms apply across 71 acres (4%).

Approximately 8,455 acres of Mexican spotted owl habitat are present in the San Juan Sag area. Of the total habitat present in San Juan Sag area, approximately 7,410 acres are available for lease, of which 5,615 acres (76%) include an NSO stipulation, 5,105 acres (69%) include a CSU stipulation, 2,961 acres (40%) include a TL stipulation, and standard lease terms apply across 318 acres (4%).

Approximately 1,961 acres of Mexican spotted owl habitat are present in the Paradox Basin area. Of the total habitat present in Paradox Basin area, approximately 1,689 acres are available for lease, of which 1,226 acres (73%) include an NSO stipulation, 627 acres (37%) include a CSU stipulation, 141 acres (8%) include a TL stipulation, and standard lease terms apply across 65 acres (4%).

Oil and gas development may affect owls through alteration of habitat caused by facility (e.g., well pads and pipelines) and/or road construction, as well as exploration equipment. Construction activities often involve use of large equipment potentially directly impacting habitat through removal of large trees, dead and down materials, etc. Such activities may also increase accessibility, opening areas to increased human disturbance.

Under the Preferred Alternative, the overall impacts to Mexican spotted owl habitat are expected to be minimal given the large amount of habitat with various lease stipulations applied. Additionally, an NSO stipulation would apply to Mexican spotted owl habitat to maintain the utility of suitable breeding and brood rearing habitat as defined in the recovery plan to promote recovery (see Conservation Measures). This stipulation would greatly reduce impacts to Mexican spotted owl, as there would be no alteration of surface habitat. The remaining stipulations, particularly CSU and TL, would also reduce impacts to habitat through protection of other resources (watersheds, soils, and terrestrial and aquatic wildlife habitat). Additionally, the application of energy-related development recommendations identified in the recovery plan would further reduce adverse effects to owl habitat.

**Roads and Trails:** The construction of roads and trails in owl habitat can result in direct and indirect effects such as direct loss of habitat and disturbance from human presence. The presence of roads also encourages public use resulting in additional impacts to habitat such as the removal of large logs, snags, and hardwoods through fuelwood cutting and dispersed camping. Access into owl habitat also increases potential for human presence and disturbance.

Under the Preferred Alternative, the construction of roads is unlikely to occur in Mexican spotted owl habitat due to topography that makes access difficult (steep terrain and in some locations physical features such as rock and riparian areas). In addition, analysis of the impacts of travel management actions on Mexican spotted owl habitat would be further evaluated in a separate but related process travel management planning. The SJNF is currently in the process of travel management planning in response to new national direction for all NFS lands. During travel management planning, more detailed analysis of roads and trails that would be open, closed, or created would be analyzed. Impacts to Mexican spotted owl would be considered, as well as other resources and use patterns, in developing these transportation plans. Where appropriate, consultation would be initiated concerning Mexican spotted owl as project-level analysis occurs for landscapes. The proposed construction of roads in Mexican spotted owl habitat and subsequent project-level analysis and implementation would require NEPA analysis and protocol surveys to determine occupancy and breeding status in the project area, and must be compliant with Section 7 requirements and LRMP direction. The LRMP contains direction to minimize or eliminate effects to habitat and potential disturbance. LRMP direction includes that found under the species' recovery plan and any additional direction developed in consultation with the USFWS. The recovery plan is listed under other referenced guidance in the terrestrial wildlife section of the LRMP.

**Land Development:** Land development is the conversion of natural land covers to non-natural surfaces for human use, including housing, commercial enterprises, and the associated infrastructure such as roads, trails, and utility structures. Land development occurs along a gradient from urban development to exurban and rural development.

Under the Preferred Alternative, the conversion of Mexican spotted owl habitat on NFS lands to nonnatural surfaces for human use, including housing developments or use by commercial enterprises is not expected. Potential effects to Mexican spotted owl habitat from roads and trails is discussed above.

**Recreation:** Recreational activities may affect owls directly through disturbances caused by human activity (e.g., hiking, shooting, and OHV use at nesting, roosting, or foraging sites, or indirectly through alteration of habitats such as damage to vegetation, soil compaction, illegal trail creation, and increased risk of wildland fires (USFWS 2012b). Whether managed or unmanaged (i.e., user-created), development of new recreational facilities (e.g., trailheads and OHV and mountain bike trails) and expansion of existing facilities (e.g., campgrounds and hiking trails) may alter owl habitat (USFWS 2012b).

Under the Preferred Alternative, a variety of recreation activities are expected. The addition of developed recreation projects/activities (roads and trails, campgrounds, trailheads, parking areas, and associated motorize use etc.) in owl habitat are possible, but highly unlikely due to the general nature and location of habitat. Dispersed recreation activities (hiking, camping, horseback riding, etc.) are expected to continue in owl habitat with overall use and potential effects similar to existing conditions. The risk of illegal OHV use in owl habitat is possible; however, occurrences and potential impacts are expected to be minimal due to difficult access. Proposed future recreation management actions under the Preferred Alternative would require NEPA analysis, protocol surveys to determine occupancy and breeding status in project areas, and site-specific Section 7 consultation with the USFWS. Proposed projects would incorporate management recommendations described in the recovery plan to reduce impacts to Mexican spotted owl and habitat from recreation activities.

**Water Developments:** Water development such as dams, permanent flooding of riparian habitats, bed degradation below dams, stream dewatering, diversions, altered-flow regimes, and artificial watering ponds (e.g., stock tanks) have potential to effect Mexican spotted owl and habitat (USFWS 2012b). Effects of development on owls vary, but can include loss or degradation of habitat, habitat fragmentation, disruption of migration corridors, inhibited gene flow, and altered grazing patterns by wild and domestic ungulates (USFWS 2012b).

The development of dams, permanent flooding of riparian areas, bed degradation below dams, stream dewatering, and activities that alter flow regimes are possible, but unlikely to occur under the Preferred Alternative. The construction and installation of watering ponds could occur in or adjacent to owl habitat to help improve livestock or wildlife distribution. Proposed water developments in owl habitat would require NEPA analysis, possibly surveys to determine occupancy and breeding status in project areas, and site-specific Section 7 Consultation with the USFWS. Proposed projects would incorporate management recommendations described in the recovery plan to reduce impacts to Mexican spotted owl and habitat from water development projects.

## **Conservation Measures**

The Preferred Alternative would incorporate management recommendations in the Mexican Spotted Owl Recovery Plan for projects/activities occurring in owl habitat.

## Minerals and Energy Lease Stipulations

The following lease stipulations would be applied to minerals and energy leases where Mexican spotted owl habitat is present.

#### No Surface Occupancy

**No surface occupancy is allowed on the lands described below**: In Mexican spotted owl habitat, as determined by a qualified biologist at the time, NSO would be allowed. Surveys of the lease area may be required to determine the presence of suitable habitat, occupation, and, if warranted, designation determination for a protected activity center.

If it is determined that suitable nesting and fledgling Mexican spotted owl habitat exists and surveys cannot be conducted, a TL would be placed from March 1 to August 31.

For the purpose of: Preventing actions that may result in take as defined under the ESA.

**Justification**: The Mexican spotted owl is a threatened species with suitable habitat within portions of the SJNF and TRFO. NSO would be allowed in these habitat areas to maintain the utility of suitable breeding and brood-rearing habitat as defined in the Mexican Spotted Owl Recovery Plan to promote recovery.

**Exceptions**: An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupancy. No exceptions would be granted within a protected activity center.

**Modifications**: The Authorized Officer may modify habitat configuration or extent based on new information. Modification of a protected activity center would be completed in consultation with the USFWS.

**Waivers:** A waiver of this stipulation maybe granted by the Authorized Officer only through a land use plan amendment. No waivers shall be granted within designated protected activity centers.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### Lease Notice

A survey of the lease area may be required to determine if unsurveyed suitable habitat is present, and the agencies should prioritize completing surveys where expressions of interest have been made for leasable mineral development. A 2-year protocol survey to determine occupation by the species would be required prior to any development activity within the identified suitable habitat. Surveys would be completed by a qualified biologist as determined by the USFWS and the managing agencies. No development activity

would take place in resultant occupied habitat until a determination is made by the USFWS and the managing agencies for designation of a protected activity center.

#### **Cumulative Effects**

Mexican spotted owl populations in Colorado are low in comparison to the core range area of New Mexico and Arizona. There are very few known breeding pairs in Colorado. There has been no breeding activity documented on the SJNF, despite the vast amount of apparently suitable habitat present. Spotted owl habitat on the SJNF consists of steep slopes containing mature or late successional mixed conifer, as well as mixed conifer forests associated with steep rocky canyons. Habitat conditions are declining to varying degree forest-wide due insects and disease and fire suppression. The potential for high-intensity wildfire is therefore a concern on both public and private lands. Land use practices occur on non-federal lands that may influence Mexican spotted owl habitat include timber management and recreation. Residential developments are also encroaching on public lands in some locations. While much of this development occurs in locations that are not considered owl habitat, it may synergistically contribute to potential effects on spotted owl habitat, such as increased fire risks or increased recreational use of public lands.

## **Determination**

The Preferred Alternative "may affect but is not likely to adversely affect" Mexican spotted owl and owl habitat. Program activities such as fire and fuels management, timber management, livestock grazing, energy development, roads and trails, and water developments may result in potential effects (positive and negative) to Mexican spotted owl. Approximately 31% of Mexican spotted owl habitat is located in WUI areas, 3% in areas suitable for timber production, 31% in other lands tentatively suitable for timber harvest, 16% in active/vacant cattle and horse grazing allotments, 31% in active/vacant domestic sheep and goat grazing allotments, and 62% in areas available for oil and gas leasing. The Preferred Alternative includes management actions such as prescribed fire, wildland fire use, fuels, and timber management that may reduce and or help reverse impacts to owl habitat from insects and disease and stand-replacement wildfire. The Preferred Alternative includes management requirements to minimize impacts from activities such as oil and gas leasing and development by including numerous lease stipulations to protect various resources occurring in owl habitat, and more importantly an NSO stipulation in owl habitat to prevent habitat alteration. Overall, the effects from management actions are expected to be minimal based on the level of potential activity occurring in owl habitat and application of management requirements in the LRMP and management recommendations described in the Mexican Spotted Owl Recovery Plan.

# 2.3 Assessment of Threatened and Endangered Aquatic Species

# Greenback Cutthroat Trout (Oncorhynchus clarki stomias)

The following policy discussion related to lineage greenback cutthroat trout is taken from the USFWS position paper on ESA consultations for lineage greenback cutthroat trout (updated October 4, 2012). It is relevant to all lineage greenback populations known to occur on SJNF lands.

## **Background**

The greenback cutthroat trout was listed as an endangered species in 1967 under a precursor to the ESA. It was relisted as endangered under the current act in 1974 and down listed to threatened status in 1978.

Until recently, greenback cutthroat trout have been considered native to the headwaters of the South Platte and Arkansas River drainages in eastern Colorado, and a few headwater tributaries of the South Platte in a small area of southeastern Wyoming (Behnke 1992). Another cutthroat trout subspecies, the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), is known to occur in the Colorado and Green River drainages in the west slope of Colorado, southwestern Wyoming, and eastern Utah. The Rio Grande cutthroat trout (*O.c. virginialis*), a candidate species, is known to occur within the Rio Grande

drainage. A fourth subspecies in Colorado, the yellowfin cutthroat trout (*O.c. macdonaldi*), was known to occur in the headwaters of the Arkansas River drainage and is believed to be extinct.

A recent genetic study (Metcalf et al. 2012) provided new information on the native range of the cutthroat trout in Colorado, as provided in the following text:

- Six cutthroat trout lineages were originally present in the state, of which two lineages have gone extinct.
- Greenbacks were native only to the South Platte drainage.
- The only known greenback cutthroat trout population, a federally threatened species, is present in Bear Creek in the Arkansas drainage.
- Cutthroat trout on the west slope of Colorado are actually divided into two lineages: the native
  range of the Colorado River cutthroat, also referred to as Lineage CR, is located in the
  Yampa/White River drainages, while another lineage, referred to as Lineage GB at this time,
  has a native range that is located in the Gunnison/Colorado River drainages.
- Another cutthroat trout lineage was present in the San Juan Mountains; it is now believed to be extinct.
- Other cutthroat trout present in streams on the east slope, which have been previously
  considered to be greenback cutthroat trout, are actually cutthroats that had been stocked
  earlier from Colorado River cutthroat and Lineage GB streams originating on the west slope
  of Colorado.

The USFWS has not confirmed its position on the new information by Metcalf et al. (2012) and is waiting for the completion of a meristic study of cutthroat trout in Colorado before conducting any reviews and making decisions on listing status. The meristic study, which was designed to complement the genetic study, is being conducted by researchers at Colorado State University and should be completed in 2013. Following completion of the meristic study, the USFWS intends to conduct a scientific peer review of the genetic and meristic studies together, involving genetic and cutthroat experts from throughout the country. Following this scientific review, the USFWS would conduct a status review of the cutthroat groups, evaluating threats and population trends, etc. If, at that time, it is determined that a new listing or a revision to an existing listing is appropriate, the USFWS would then conduct a formal rulemaking process.

# Section 7 Consultation Requirements

The identification of Lineage GB fish in western Colorado and eastern Utah has raised concerns regarding whether there is a need for application of the ESA (particularly Section 7 consultation) in these areas. Although the greenback was listed range-wide, its distribution was designated only as Colorado. Thus, any greenback lineage fish found in Utah or Wyoming would not currently receive any protections under the ESA.

Until the review and rulemaking process, if necessary, have been completed, the USFWS has advised federal agencies to continue to conduct consultations for actions that may affect the currently listed cutthroat trout in Colorado; therefore, this would include all cutthroat populations that have been identified as greenback, including Lineage GB and Lineage CR on the eastern slope and Lineage GB on the western slope of Colorado.

#### Colorado River Cutthroat Trout Conservation

The Colorado River Cutthroat Trout Conservation Team updated the Conservation Strategy and Agreement in March 2006. Signatories to the agreement include the state wildlife agencies of Colorado, Utah, and Wyoming; the USFS; the BLM; and the USFWS (Colorado River Cutthroat Trout Conservation Team 2006). The purpose of the strategy is to provide a framework for the long-term conservation of the Colorado River cutthroat trout and reduce or eliminate the threats that warrant its status as a sensitive species or species of concern by federal and state resource agencies. The objectives of the strategy are to identify and characterize all core and conservation populations, secure and enhance conservation populations, restore populations, secure and enhance watershed conditions, and conduct public outreach, data sharing, and coordination. The three states, USFS, BLM, and USFWS have committed to implement the strategy.

The USFWS believes that implementation of the Colorado River Cutthroat Trout Conservation Team strategy to conserve and protect Colorado River cutthroat trout populations throughout its range would also adequately protect any Lineage GB populations. Therefore, agencies should include these activities in their Biological Evaluations/Assessments (BE/BAs as conservation measures for Lineage GB populations.

## **Existing Condition**

Once widespread, the greenback cutthroat trout is now thought to be limited to a single population located in Bear Creek within the Arkansas drainage. What is now being referred to as "lineage greenback cutthroat trout" is present in the Arkansas, South Platte, and Colorado River systems. These fish inhabit clear, cold foothill and mountain waters and require clean gravel substrates to successfully spawn and reproduce. The greenback evolved in environments containing low species diversity with few competitors and their competitive mechanisms are not well developed. This compromises their ability to coexist with other species of trout. They are also known to be relatively easy to harvest by anglers, which renders them susceptible to overfishing.

Populations of greenback began to decline when settlers first arrived and began developing areas associated with greenback occurrence. Mining in its native river basins led to sediment and toxic runoff, which compromised the greenbacks aquatic habitats. This, along with water diversion for agriculture and overfishing, contributed to the decline of many greenback populations. However, the introduction of non-native and non-endemic species such as brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), and other cutthroat species (*Oncorhynchus clarki spp.*) has likely had the greatest ongoing detrimental impact to greenback cutthroat populations. The two fall spawning species, brown trout and brook trout, directly compete and displace the greenback. The two spring spawning species, rainbow trout and other cutthroat subspecies, interbreed with the greenback resulting in genetic hybrid progeny.

# Lineage Greenback Populations Occurring on the San Juan National Forest

Four populations of lineage greenback trout are known to occur on the SJNF, all of which occupy tributaries of the Dolores River system: Rio Lado Creek, Little Taylor Creek, Spring Creek, and Roaring Forks Creek. The Rio Lado Creek population is isolated due to a migration barrier installed by the USFS in 2003. Although some degree of isolation exists for the other three locations, there are no well-defined barriers that preclude upstream migration of non-native species.

While easily accessible, the four locations do not receive much recreational fishing use and angling mortality is low. These are relatively small, first and second order streams with very low stream flows occurring in late summer and winter periods. Habitat constraints resulting from low natural stream flow is likely a controlling biological factor for all four greenback populations.

# **Grazing Suitability Decision**

All four lineage greenback streams are located within established livestock grazing allotments. The Rio Lado and Divide (Roaring Forks Creek) allotments are presently vacant and no grazing has occurred in recent years. The Little Taylor and Spring Creek allotments are open to grazing and are being stocked annually. The Spring Creek allotment is heavily stocked and some sections of the stream may be affected by grazing activity. No studies have been done to evaluate the potential effects of grazing on the lineage greenback population in Spring Creek. A walkthrough evaluation conducted in 2011 suggests there are no grazing impacts to Little Taylor Creek.

## **Timber Suitability Decision**

Under the Proposed Action, portions of the four occupied watersheds are identified as being suitable for timber harvest. Lands designated as suitable include 70% of the Spring Creek watershed, 53% of the Rio Lado watershed, 90% of the Little Taylor Creek watershed, and 84% of the Roaring Forks Creek watershed. However, the suitability determination does not reflect the likelihood or extent of timber harvest that may occur. Presently, the commercial demand for timber is very low and there are no plans

to conduct any harvest activities within the four occupied watersheds. Any harvest that may occur would likely be done to maintain forest health (i.e., beetle kill salvage and Sudden Aspen Decline salvage). Under any harvest scenario, LRMP objectives, standards, and guidelines would minimize any potential effects of harvest activities to the occupied streams (see Appendix J.B).

# Special Uses

There are no known special use activities (e.g., water development projects) present, planned, or proposed for any of the four greenback locations. However, should future proposals be developed, the LRMP habitat maintenance standards specific to aquatic species would apply (see Appendix J.B, Section 2.5 and 2.6).

#### Oil and Gas Leasing

All four lineage greenback populations are located to the east of the Paradox Basin and other areas suitable for conventional and gothic shale development. It is improbable that the cumulative effects of water consumption resulting from any oil and gas development on the SJNF would influence the availability of water in the four occupied streams.

# Direct, Indirect, and Cumulative Effects Related to Land and Resource Management Plan Implementation

Being small headwater streams surrounded by NFS lands, there is little potential for habitats occupied by lineage greenback cutthroat to be influenced by state and private actions. No private inholdings or mining claims occur within the occupied areas of these watersheds. Therefore, the potential for cumulative adverse effects associated with state and private actions is very low.

Of primary concern to the Spring Creek, Little Taylor Creek, and Roaring Forks Creek is the potential for the introduction of other species of trout into the stream section now occupied by lineage greenback cutthroat. The SJNF and CPW plan to conduct evaluations to determine the potential for non-native species introductions, specifically to identify the need for the installation of barriers to prevent upstream migration of non-native species. There is no decision under the LRMP revision that would increase the potential for exotic species introductions into these streams.

For the Spring Creek and Little Taylor Creek watersheds, the potential for adverse effects from livestock grazing presents the next highest risk to these two populations, followed by the potential for wildfire, water developments, timber harvest, and recreational activities, which apply to all four occupied watersheds. All of these activities have to potential to impact the quantity or quality of aquatic habitats that greenback rely upon.

Livestock grazing can impact riparian vegetation, reduce overhead cover, compromise stream bank integrity, increase bank erosion and sedimentation, and alter the width to depth ratios of a stream. These alterations can directly influence the biological limiting factors for a variety of life stages of fish, including spawning habitats, rearing habitats, foraging habitats, and overwintering habitats.

Wildfire can have devastating impacts on aquatic habitats. Some fires reduce ground cover and sterilize soils to the point where long-term erosion and sedimentation preclude fish survival. Short-term impacts may also occur as a result of fire retardant applications. To minimize the potential for these impacts, the SJNF has an aggressive prescribed fire program intended to reduce fuels and reduce the potential for catastrophic wildfires. The SJNF has also established a 600-foot buffer zone around all perennial streams where fire-retardant application is not allowed.

On-going water developments have major impacts on many streams within the planning area. These developments reduce the quantity and quality of aquatic habitats by removing water, the basic component that often dictates the abundance and distribution of fish populations within the planning area. As previously stated, no water developments exist within the occupied stream reaches and it is unlikely that any future water developments would be permitted that would affect the occupied reaches. In the unlikely

event that such developments would be authorized, the instream flow standards of the LRMP would be applied (see Appendix J.B, 2.5.18).

Timber harvest may also impact a variety of aquatic habitat characteristics that fish rely upon. Of primary concern is a reduction in woody debris recruitment to the stream, which in turn reduces habitat complexity, overwintering habitat features, and organic nutrients and overall stream productivity. Roads and trails used to conduct timber harvest can also be problematic since they may increase erosion and act as hydrologic conduits that transport sediment to the streams.

Oil and gas leasing would not be associated with any of the four occupied watersheds. Therefore, the oil and gas leasing decision would have no direct, indirect, or cumulative effects on lineage greenback cutthroat trout.

A variety of management direction and planning components (planning objectives, desired conditions, standards, and guidelines) for aquatic species contained in the revised LRMP are intended to mitigate any ongoing effects and prevent new adverse effects to the four lineage greenback populations (see Appendix J.B, Sections 2.2, 2.5, and 2.6). Considering all decisions to be implemented under the revised LRMP, and with consideration of the overall approach to species conservation contained within the LRMP (see Appendix J.A), it is our determination that implementation of the Proposed Action **may effect, but is not likely to adversely affect** any of the four lineage greenback populations occurring on the SJNF.

# Federally Listed Fish Species Occurring Off-Forest

A variety of actions occurring on SJNF lands have the potential to affect four federally listed fish species that occupy segments of the Upper Colorado River and the San Juan River. Two species, the Colorado pikeminnow and the razorback sucker, are known to occupy the San Juan River. These two species and two additional species, the humpback chub and bonytail chub, are known to occupy the upper Colorado River and some of its tributaries, including the lower Dolores River. Two endangered fish recovery programs are applicable to actions occurring within the planning area. The Upper Colorado River Endangered Fish Recovery Program applies to the Dolores River and its tributaries, while the San Juan River Basin Recovery Implementation Program applies to the San Juan River and its tributaries (Public Law 106-392, 114 Stat. 1602, as amended; Public Law 107-375, 116 Stat. 3113).

# **Consultation History**

For historic SJNF actions associated with the Dolores River drainage, formal consultation was conducted under the Programmatic Biological Assessment for Minor Water Depletions Associated with Routine Forest Decisions In the Upper Colorado River Basin (USFS 1993), and the related BO by the USFWS, the Final Biological Opinion for Small Water Depletions on Seven National Forests in Colorado and One in Wyoming (USFWS 1993). For the San Juan River Basin, the SJNF initiated formal consultation in January 1996 under the San Juan National Forest Programmatic Biological Assessment for Water Depletions Associated with Routine Forest Actions Occurring within the Upper San Juan River Basin (USFS 1996) and the related BO of March 1996 (USFWS 1996). These two consultations addressed the majority of historic water uses authorized by the SJNF that were determined to have adverse effects on the four endangered fish species. Numerous other project-level consultations have occurred since then, primarily to address new consumptive water uses.

# Colorado Pikeminnow (Ptychocheilus lucius)

## **Background and Existing Condition**

The Colorado pikeminnow is the largest member of the cyprinid family native to North America, with reports of individuals up to 6 feet long and weighing over 100 pounds. It evolved as the top predator of all native species in the Colorado River system. It was once found throughout warm water reaches of the entire Colorado River Basin down to the Gulf of California, including reaches of the upper Colorado River and its major tributaries, the Green River and its major tributaries, the San Juan River and some of its tributaries, and the Gila River system in Arizona (Platania 1990; Seethaler 1978). Seethaler (1978) indicates the species was abundant in suitable habitat throughout the entire Colorado River Basin prior to

the 1850s. However, pikeminnow were not known to occur in colder, headwater streams, which describe the majority of streams occurring throughout the planning area.

The decline in Colorado pikeminnow populations is correlated with the construction of dams and reservoirs occurring between the 1930s and 1960s, the introduction of non-native fishes, and the removal of vast quantities of water from the Colorado River system. Dams, impoundments, and water use practices are the major reasons for drastically modified natural river flows and channel characteristics in the Colorado River Basin. Dams on the mainstem have segmented the river system, blocking spawning migrations and changing flows and temperatures. Major changes in species composition have occurred with the introduction of non-native species. In the upper Colorado River Basin, declines in pikeminnow populations occurred primarily after the 1960s, when the following dams were constructed: Glen Canyon Dam on the mainstem Colorado River, Flaming Gorge Dam on the Green River, Navajo Dam on the San Juan River, and the Aspinall Unit dams on the Gunnison River.

The decline of pikeminnow is also related to competition or other behavioral interactions with non-native fishes. Alterations in the natural fluvial environment have exacerbated this problem (USFWS 1995b).

By the 1970s, pikeminnow were extirpated from the entire lower Colorado River Basin (downstream of Glen Canyon Dam) and from portions of the upper Colorado River Basin, as a result of major alterations to riverine environments. Having lost approximately 75% to 80% of its former range, the pikeminnow was federally listed as an endangered species in 1967 (USFWS 1967).

In 1994, critical habitat was designated within the 100-year floodplain of the Colorado pikeminnow's historical range for several sections of the Colorado River system (59 Federal Register 13374). The section relevant to actions occurring within the planning area is limited to the following critical habitat designation:

New Mexico, San Juan County; and Utah, San Juan County. The San Juan River and its 100-year floodplain from the State Route 371 Bridge in Section 17, Township 29 North, Range 13 West (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in Section 26, Township 41 South, Range 11 East (Salt Lake Meridian) up to the full pool elevation.

# Life History and Limiting Factors

The pikeminnow recovery goals summarize threats to the species as follows: stream regulation, habitat modification, competition with and predation by non-native fish, and pesticides and pollutants (USFWS 2002b). The life history phases that appear to be most limiting for pikeminnow populations include spawning, egg hatching, development of larvae, and the first year of life. These phases of pikeminnow development are tied closely to specific habitat requirements.

Known spawning sites are characterized by riffles or shallow runs with well-washed coarse substrate containing relatively deep interstitial voids (for egg deposition) in association with deep pools or areas of slow non-turbulent flow used as staging areas by adults (Lamarra et al. 1985; Tyus and Karp 1990). Recent investigations at a spawning site in the San Juan River by Bliesner and Lamarra (1995) are consistent with these characteristics. The most unique feature at the sites used for spawning, in comparison with otherwise similar sites nearby, is the lack of embeddedness of the cobble substrate and the depth to which the rocks are devoid of fine sediments (Bliesner and Lamarra 1995; Lamarra et al. 1985).

Pikeminnow often migrate considerable distances to spawn in the Green and Yampa Rivers (Archer et al. 1985; Miller et al. 1982; Tyus 1985, 1990; Tyus and McAda 1984), and similar movement has been noted in the mainstem San Juan River. A fish captured and tagged in the San Juan arm of Lake Powell in April 1987 was recaptured in the San Juan River approximately 80 miles upstream in September 1987 (Platania 1990).

Ryden and Ahlm (1996) found that pikeminnow in the San Juan River aggregated at the mouth of the Mancos River prior to spawning. Miller et al. (2000) also recorded two pikeminnow in both 1993 and 1994 at the mouth of the Mancos River prior to the spawning period. Historical spawning areas for the pikeminnow in the San Juan River are unknown; however, Platania (1990) speculated that spawning likely occurred upstream at least to Rosa, New Mexico.

Tributaries are the primary area of residence to which the adults return after spawning. Tributaries to the San Juan River no longer provide habitat for adults because they are totally dewatered or access is restricted (Holden 2000). Pikeminnow utilized the Animas River in the late 1800s. The Animas could still provide suitable habitat; however, the uppermost location of the present pikeminnow population is approximately 50 miles downstream from the mouth of the Animas River (Holden 2000). Pikeminnow are known to have aggregated at the mouth of the Mancos River prior to spawning as late as the early 1990s (Miller et al. 2000; Ryden and Ahlm 1996).

Successful reproduction was documented in the San Juan River in 1987, 1988, and 1992 through 1996, by the collection of larval and fingerling pikeminnow. Platania (1990) noted that, during 3 years of studies on the San Juan River (1987–1989), spring flows and pikeminnow reproduction were highest in 1987. Recent studies also found catch rates for fingerling pikeminnow to be highest in high water years, such as 1993 (Buntjer et al. 1994; Lashmett 1994).

Due to the low numbers of pikeminnow collected in the San Juan River, it is not possible to quantify population size or trends. Estimates during a 7-year research period between 1991 and 1997 suggest that there were fewer than 50 adults in a given year (Ryden 2000).

The ability of the pikeminnow to withstand adverse impacts to its populations and its habitat is difficult to determine given the longevity of individuals and their scarcity within the San Juan River Basin. The younger life stages are considered the most vulnerable to predation, competition, toxic chemicals, and habitat degradation. It may take many years for a population of pikeminnow to recover from these types of impacts.

Surface water and groundwater quality in the Animas, La Plata, Mancos, and San Juan River drainages have become concerns in recent years (Abell 1994). Changes in water quality and contamination of associated biota are known to occur in reclamation projects in the San Juan drainage (i.e., irrigated lands on the Pine and Mancos Rivers) where return flows from irrigation make up a portion of the river flow (Sylvester et al. 1988). Increased loading of the San Juan River and its tributaries with heavy metals; elemental contaminants such as selenium, salts, polycyclic aromatic hydrocarbons; and pesticides have degraded water quality of the San Juan River in critical habitat (Abell 1994; Holden 1999; Wilson et al. 1995).

# Razorback Sucker (Xyrauchen texanus)

#### Distribution

The razorback sucker was historically abundant and widely distributed within warm water reaches throughout the Colorado River Basin. It was found in the mainstem Colorado River and major tributaries in Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and Mexico (Ellis 1914; Minckley 1973). It was once so numerous early settlers used it for food, and as recently as 1949 commercially marketable quantities were being caught in Arizona (Bestgen 1990).

The current distribution and abundance of the razorback sucker has been significantly reduced throughout the Colorado River system. The only substantial population of razorback suckers remaining is in Lake Mohave and consists of mostly old adults (McCarthy and Minckley 1987). This population is not successfully reproducing and recruiting. Limited numbers of razorbacks do persist in other locations in the lower Colorado River, but they are considered rare or incidental and may be continuing to decline.

In the Upper Basin, above Glen Canyon Dam, razorback suckers are found in limited numbers in both lentic and lotic environments. The largest population of razorback in the Upper Basin is found in the Upper Green River and lower Yampa River (Tyus 1987). In the Colorado River, most razorback suckers

occur in the Grand Valley area near Grand Junction, but they have declined drastically since 1974 (Osmundson and Kaeding 1991). The lack of recruitment suggests a combination of biological, physical, and/or chemical factors that may be affecting the survival and recruitment of early life stages of razorback suckers. Recovery efforts include the capture and removal of razorback suckers for hatchery programs (USFWS 1990).

#### Reason for Concern

A marked decline in populations of razorback suckers can be attributed to construction of dams and reservoirs, introduction of non-native fishes, and removal of large quantities of water from the Colorado River system. Dams on the main stem Colorado River and its major tributaries have segmented the river system and drastically altered flows, temperatures, and channel geomorphology. Major changes in species composition have occurred due to the introduction of numerous non-native fishes, many of which thrived due to human-induced changes to the natural river system (USFWS 1995b).

# Life History

A natural hydrograph with a large spring peak, gradually descending limb into early summer, and low stable flows through summer, fall, and winter are thought to create the best habitat conditions for razorback suckers. Prior to construction of large mainstem dams and the suppression of spring peak flows, low-velocity off-channel habitats were commonly available throughout the Upper Basin. The present absence of these seasonally flooded riverine habitats is believed to be a limiting factor in the successful recruitment of razorback suckers in their native environment (Osmundson and Kaeding 1991; Tyus and Karp 1989).

Springtime aggregations of razorback suckers in off-channel impoundments and tributaries are believed to be associated with reproductive activities (Tyus 1987). These off-channel habitats are warmer than the mainstem. Razorback suckers use these areas for feeding, resting, sexual maturation, spawning, and other activities associated with their reproductive cycle (Tyus and Karp 1990). Sexually mature razorback suckers are generally collected on the ascending limb of the hydrograph from mid-April through June and are associated with coarse gravel substrates (USFWS 1990).

Outside the spawning season, adult razorback suckers occupy a variety of shoreline and main channel habitats, including low runs, shallow to deep pools, backwaters, eddies, and other relatively slow-velocity areas associated with sand substrates (Osmundson and Kaeding 1989; Tyus 1987; Tyus and Karp 1989).

Habitat requirements of young and juvenile razorback suckers in the wild are largely unknown, particularly in native riverine environments. Life stages, other than adults, have not been collected in the Upper Basin in recent times (USFWS 1995b).

# Humpback Chub (Gila cypha)

#### Distribution

Humpback chub originally inhabited the mainstem Colorado River from what is now Lake Mead to the canyon areas of the Green and Yampa River Basins. It was considered less common than other endemic fish of the region, but occurred in fairly large numbers where reproducing populations existed. The greatest concentrations of humpback chub occur in the Grand Canyon portion of the Colorado and Little Colorado Rivers and Westwater/Blackrocks region of the Colorado River. Smaller populations and incidental catches are reported from the Yampa River; Desolation, Gray, and Whirlpool Canyons of the Green River; and Cataract Canyon of the Colorado River (USFWS 1995b).

#### Reason for Concern

Shoreline eddies associated with sand and boulders are important breeding areas. Availability of shoreline eddy habitat is greatest with spring flooding and decreases thereafter with decreasing summer flows; spring runoff forms and maintains these habitats. Loss of spring runoff could reduce availability of spawning habitat and consequently adversely affect humpback chub reproduction. Habitat alteration may

also promote hybridization. Flow reductions and decreased temperatures were implicated as factors curtailing successful spawning and increasing competition in the Colorado River (USFWS 1995b).

# Life History

During spring and early summer, humpback chub are most prevalent in high-gradient, rocky-run, riffle, and rapid dominated whitewater reaches. Adult fish are most often collected in seasonally flooded shoreline eddies that are downstream of large boulders and upstream of rapids. Juveniles are more common in smaller eddies in rocky shoreline runs. Feeding habits of humpback chub are relatively unknown; however, stomachs of sampled fish contained hymenopterans and plant debris. They also feed on Mormon crickets (*Anabrus simplex*) and presumably other foods. In fall and winter, fish remain in pools and eddies of impounded water and rapids in low flow conditions (Tyus and Karp 1990).

Humpback chub generally spawn between temperatures of 16°C to 20°C but may also spawn in temperatures as low as 11.5°C and as high as 20.5°C (Kaeding and Zimmerman 1983; Valdez and Clemmer 1982). Eggs are adhesive, but little is known about preferred substrate for egg deposition. Hatchery success diminishes as temperatures vary from their optimum of 20°C. The eggs generally hatch in 5 to 7 days (Hamman 1982).

Humpback chub spawn in spring and early summer following highest spring flows. This includes May and June in low and average years, but extended to July during the high flow year 1986. Ripe fish are predominately captured in shoreline eddy habitats, and there is some indication that these fish remain in or near specific eddies for extended periods and return to the same eddy during different spawning seasons (Tyus and Karp 1990).

Larval and young of the year humpback chub are generally found in low-velocity microhabitats associated with backwaters and eddies. Fish grow from 7.5 to 10.5 centimeters during their first year of life, and by age 2 many are 200 millimeters. Males begin reaching sexual maturity at age 2 and females at age 3. Once humpback chubs reach sexual maturity growth slows considerably (USFWS 1995b).

# Bonytail Chub (Gila elegans)

#### Distribution

Historically the bonytail chub occurred throughout the Colorado River mainstem and its major tributaries, including the Gila and Salt Rivers in the lower basin and the Green, Yampa, White, Gunnison, and San Juan Rivers in the upper basin. Recent collections indicate the fish is extremely rare and is extirpated from much of its former range, although individual fish are still occasionally collected from the upper and lower basins. Supplemental stocking from hatchery fish and maintaining stocks in hatcheries may be necessary to preclude this species from becoming extinct. The recovery goal for bonytail chub is to "prevent immediate extinction" (USFWS 1995b).

#### Reason for Concern

This species has drastically declined since 1960. Until recently, the USFWS considered the species extirpated from the upper basin; however, a recently collected specimen, which exhibits many bonytail chub characteristics, could indicate a small extant population (Kaeding et al. 1986)

#### Life History

A radio tracking study of adult bonytail chub movement indicated they are crepuscular and are inactive during the day and night. Spawning is believed to occur from between mid-June and early July when water temperatures are near 18°C. The optimum temperature for hatching success is 20°C to 21°C. Hatching success decreases considerably when water temperatures vary plus or minus 10°C. Hatching occurs in 4 to 7 days under optimum conditions (Hamman 1982). Little data exist on larval and juvenile bonytail chubs. Their survival and growth are presumed to be dependent on low-velocity habitats (USFWS 1995b).

#### **Effects Determinations**

The cause and effect relationships as related to actions occurring on SJNF lands within the San Juan and Dolores River Basins are identical for the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub. Therefore, a single effects analysis is provided that applies to all four species.

# Direct, Indirect, and Cumulative Effects Related to Land and Resource Management Plan Implementation

The USFWS has determined that the effects of water depletions and regulated flows are the activities with the greatest potential to impact the four endangered Colorado River fishes. Consumptive water uses reduce the magnitude and duration of peak flows. This causes losses of backwater pools for spawning and rearing. It also reduces suspended sediments, which confer a competitive advantage on non-native species. These water depletions occur on federal, state, and privately owned lands primarily as a result of agricultural irrigation, municipal and domestic uses, oil and gas development, ski area operations, and reservoir evaporation.

In addition, reservoir operations have changed the natural flow and temperature regimes, reduced suspended sediments, created barriers to fish migration, and transformed thousands of miles of lotic habitats into lentic habitats. The reservoirs have also been stocked with an assortment of non-native fish species, which are now competing with the native fishes

There are a variety of federal actions occurring within the planning area that have the potential to alter the quantity, quality, or timing of water leaving the SJNF. These actions have the potential to negatively affect the four endangered fish species that reside downstream. Primary among these is the authorization of reservoirs and diversion structures, and the leasing of lands for the purpose of oil and gas development. In addition, there are numerous actions that result in minor water depletions, such as campground developments, road construction and dust abatement, construction of small stock ponds, domestic well construction, etc. Also, very small increases in water yield are predicted to be associated with timber harvest and prescribed fire treatments. Ski area management also has an influence on water availability and the timing of flows. As new ski area terrain is developed, it is likely that more snowmaking would occur, altering quantity and timing of flow leaving NFS lands. The acreage cleared of timber to accommodate new ski runs may also affect water yield and the timing of winter and spring flows.

The impacts related to water use and development projects (including diversion ditches, storage reservoirs, pipelines, and wells) on water quantity, timing, water quality, fisheries, and aquatic species are specifically described in the Water Resources and Aquatic Ecosystems and Fisheries sections of the LRMP. The primary impact to aquatic ecosystems and aquatic species would be from reduced or eliminated stream flows, and the related degradation or elimination of aquatic habitats. Additional impacts on fisheries and aquatic species may include increased stream temperatures and reduced dissolved oxygen levels. These impacts may be more pronounced during periods of natural cyclic flow reductions (during fall and winter) or during summer months in a drought. Winter base flows would also be reduced when ski area operations divert water from streams and/or utilize well water that may be connected to and influence surface flows. This may limit aquatic habitats and dependent aquatic communities.

Collectively, the aforementioned uses have dramatic effects on stream flows and aquatic habitats occupied by the four endangered Colorado River fishes. Even though they may be located on NFS lands and affect SJNF resources, many of these uses (especially large reservoir operations) are not under the discretion of the USFS. Many other uses occur on state and private lands, typically located downstream of NFS lands.

It is expected that SJNF special use authorizations (primarily existing and new water developments), recreational developments, road maintenance activities, and stock pond construction would deplete varying amounts of water from the San Juan and Dolores River Basins. Where possible, the estimated water volumes associated with these activities are discussed in Appendix J.C. Project-level assessments would add to and refine these amounts when necessary.

#### Water Depletions Associated with Livestock Grazing

The impacts related to livestock grazing on bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker would generally be minor because these fish species do not occur within the planning area. With the exception of associated water depleting activities, livestock grazing would not impact their habitats. The development of new stock watering features (stock ponds and springs) would result in minor water depletions to the San Juan and Dolores River Basins. It is unknown exactly how many facilities might be constructed over the life of the LRMP, but it is expected that the associated cumulative net depletion amount would be less than 5 acre-feet per year.

#### Water Depletions Associated with Road Maintenance and Construction

Small amounts of water would be used for road construction and reconstruction, road maintenance, and dust abatement, resulting in short-term water depletions to the San Juan and Dolores River Basins. This water would be obtained from federal and private sources and would include contracted actions (e.g., Schedule A maintenance by counties to apply magnesium chloride, etc.). It is estimated that these actions would use approximately 9 acre-feet per year from the San Juan River Basin and 6 acre-feet per year from the Dolores River Basin over a 15-year period, excluding road-related activities with gas well drilling and completion.

#### Other Actions

There are a variety of other actions that may be implemented during the life of the LRMP. The USFS cannot predict the type, location, or extent of these actions, as they would likely be in response to external special use proposals. As necessary, these proposed actions would undergo project-level NEPA assessments and be subject to terms and conditions connected to the LRMP components (see Appendix J.B) and may be subject to additional Section 7 ESA consultation requirements.

## Determination for the Land and Resource Management Plan

Providing adequate stream flows to maintain aquatic habitats for the four endangered fish species is a primary component of the recovery efforts for the four endangered big river fishes. Ongoing and new consumptive water uses, such as those likely to be authorized and implemented under the LRMP, run counter to these efforts and would add to the overall cumulative impacts to these species. Therefore, implementation of the LRMP **may affect and is likely to adversely affect** the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub.

## Direct, Indirect, and Cumulative Effects Related to Oil and Gas Leasing

Substantial quantities of water are projected to be used to drill, fracture, and complete wells for both GSGP and conventional well development. The projected water uses are described in detail in Appendix J.C. Applicable mitigation measures (LRMP components) and oil and gas leasing stipulations are described in Appendix J.B.

GSGP wells would use approximately 7.9 to 13.1 acre-feet of water per well for the entire process. This level of consumption is six to 11 times the amount of water used to drill and complete a conventional gas well, and 11 to 18 times the amount of water used to drill and complete a single CBM well. Paradox conventional gas wells would use 3.3 acre-feet of water per wells to drill and complete. Total water consumption for GSGP and conventional oil well development in the Dolores and San Juan River Basins is estimated at 4,831 and 201 acre-feet, respectively (see Table 7 in Appendix J.C).

In the Northern San Juan Basin, CBM wells would be drilled on existing leases, but doubling the number of wells on each well pad. In total, 126 new federal wells are projected. Water consumption to drill, complete, and operate the wells over their 20-year economic life is estimated at 241 acre-feet. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives (see Table 7 in Appendix J.C).

## Determination for Oil and Gas Leasing

Providing adequate stream flows to maintain aquatic habitats for the four endangered fish species is a primary component of the recovery efforts for the four endangered big river fishes. Ongoing and new consumptive water uses, such as those to be implemented under the oil and gas leasing decision, run counter to these efforts and would add to the overall cumulative impacts to these species. Therefore, implementation of the LRMP **may affect and is likely to adversely affect** the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub.

# 2.4 Assessment of Threatened and Endangered Plant Species

# Pagosa skyrocket (Ipomopsis polyantha)

## **Background**

Pagosa skyrocket is an herbaceous biennial in the phlox family, typically from 12 to 24 inches tall. It has short, tubular white flowers that are often flecked with purple dots (Anderson 2004). The species typically blooms from mid-June to mid-July. During a pollinator study in 1992 and 1993, over 30 different insects were collected visiting Pagosa skyrocket, with bee species being the primary pollinators (Collins 1995). However, the study did not determine which species was the most important pollinator of Pagosa skyrocket (Wilken 2003). Based on the findings from this study, and the fact that Pagosa skyrocket sets far less fruit when self-pollinated than when pollinators are present, it has been concluded that pollinators and their associated habitats are essential for the long-term successful reproduction and conservation of the plant. Pagosa skyrocket is considered a ruderal species, which means it is one of the first plant species to colonize disturbed lands (USFWS 2012c).

Pagosa skyrocket was listed as endangered under the ESA, effective August 26, 2011 (USFWS 2011c). Critical habitat for Pagosa skyrocket was designated on August 13, 2012 (USFWS, 2012), and is discussed in more detail below. There is currently no recovery plan for this species.

#### **Status and Distribution**

Pagosa skyrocket is found only on Mancos Shale soils in and around the town of Pagosa Springs in Archuleta County. Population numbers fluctuate greatly from year to year, as is typical with biennial species. In 2011, it was estimated that there were 162,220 flowering plants between the two known populations. Collectively, these two populations occupy approximately 388 acres. The larger of the two populations is found on municipal and private lands in and around the town of Pagosa Springs and is estimated to contain 161,950 flowering plants on 342 acres. The second, smaller population is found on BLM, private, and Colorado Department of Transportation (CDOT) and Archuleta County ROWs near the old town site of Dyke, Colorado, approximately 13 miles to the west of the first population. In 2011, it was estimated that this population contained 270 flowering plants on 46 acres. Only 2.5% of the habitat occupied by this species is on federally managed land, with the remaining occupied habitat occurring on private and municipal lands, as well as along CDOT, Archuleta County, and private road ROWs (USFWS 2011c). This species is not known to occur on NFS lands, but is found on BLM land.

## Habitat

**Suitable Habitat:** As would be expected from a ruderal species, Pagosa skyrocket is found only within areas with light to moderate or discontinuous disturbances. Current populations are limited to Mancos Shale soils from the Upper Cretaceous period, at elevations between 6,750 and 7,775 feet (USFWS 2011c). This includes, but is not limited to ROWs alongside U.S. Highways 84 and 160, in roadside ditches, in areas cleared for overflow parking at the local rodeo grounds, along utility corridors, and in previously heavily grazed pasture land. It is often found on barren shales where very little other vegetation grows, but can also be found within a variety of vegetation types, including montane grasslands, within and at the edges of ponderosa pine stands, and in juniper/Gambel oak plant communities (Anderson 2004; USFWS 2012c). Within these vegetation types, it is typically found in more open areas or in small, sparsely vegetated areas where plant cover is less than 5% or 10% (USFWS 2012c). Although outcrops of Mancos Shale and soils derived from Mancos Shale within the elevation

range of Pagosa skyrocket are common in Archuleta County and surrounding areas, the species is found on only a very tiny portion of this formation. Work conducted by Collins in 1995 on seed germination and pH measurements suggest that this species has very specific physiological requirements for germination and growth that might prevent its spread to other locations. However, it may also be dispersal limited, which may preclude its colonization of otherwise suitable sites (Anderson 2004). There are approximately 148,442 acres of suitable habitat for Pagosa skyrocket in Archuleta County. Approximately 27%, or 41,373 acres, occurs on the SJNF. Pagosa skyrocket has never been found on any of the suitable habitat on the SJNF. Approximately 2%, or 3,282 acres, occurs within the TRFO. Pagosa skyrocket has been found in a small portion of an isolated 42-acre parcel of BLM. The remaining suitable habitat on BLM lands in Archuleta County is unoccupied.

**Critical Habitat:** On August 13, 2012, the USFWS designated approximately 9,641 acres of critical habitat for Pagosa skyrocket for the purpose of conserving the species and its habitat. Four critical habitat units were designated in Archuleta County. These are, as they occur from west to east, 1) Dyke, 2) O'Neal Hill, 3) Pagosa Springs, and 4) Eight Mile Mesa. Both the Pagosa Springs unit and the Dyke unit are currently occupied by Pagosa skyrocket. The O'Neal Hill and Eight Mile Mesa units are unoccupied, but were designated as critical habitat because the USFWS felt that two populations do not offer adequate redundancy for the survival and recovery of Pagosa skyrocket (USFWS, 2012).

The Pagosa Springs unit is the largest at 6,456 acres, occurring on municipal, state, and private lands, and contains a majority of the known Pagosa skyrocket (USFWS, 2012). The Dyke unit is a total of 1,475 acres, with 42 acres on BLM lands and the remaining acreage on private lands and within CDOT and Archuleta County ROWs. This unit contains the smaller of the known populations and the only known portion of the population that occurs on federal land. The O'Neal Hill unit (564 acres) and Eight Mile Mesa unit (1,146 acres) are both entirely on NFS lands within the Pagosa Ranger District of the SJNF. Currently, Pagosa skyrocket does not occur in these two units, so they are considered unoccupied critical habitat. The O'Neal Hill unit is partially within the O'Neal Hill Special Botanical Area (SBA). All of the critical habitat units, occupied and unoccupied, contain the primary constituent elements needed to support the life-history processes of this species. The primary constituent elements described by the USFWS in the critical habitat designation include:

- 1. Mancos shale soils;
- 2. Suitable elevations and climate conditions elevations between 6,400 to 8,100 feet, and climate conditions that provide suitable precipitation, cold, dry springs and winter snow;
- 3. Suitable plant communities barren shales, open montane grassland, clearings within ponderosa pine, juniper, and/or oak communities;
- 4. Habitat for pollinators a mosaic of native plant communities that can provide pollinator ground and twig nesting areas suitable for a wide range of pollinators, connectivity between areas, availability of floral resources, and a 1,000-meter area beyond occupied habitat to conserve pollinators essential for plant reproduction); and
- 5. Appropriate disturbance regimes appropriate disturbance levels (light to moderate, or intermittent or discontinuous disturbance) and naturally maintained disturbances through soil erosion, or human-maintained disturbances, which can include light grazing, occasional ground clearing, and other disturbances that are not severe or continual. (USFWS 2012c)

#### Direct and Indirect Effects

The final rule listing Pagosa skyrocket as endangered described several threats to this species. These include 1) the direct mortality and permanent loss of habitat due to development on private, commercial, residential, municipal, and agricultural property, including impacts associated with installation of utilities and access roads; 2) the destruction of flowering plants, rosettes, and seeds from heavy livestock use; 3) inadequate regulatory mechanisms on private, commercial, residential, municipal, and agricultural property to address the primary threats to the species; and 4) other natural and human-made factors, including effects of drought and climate change, lack of proven methods for propagation and reintroduction, specific soil and germination requirements, and fragmented habitat. Activities that may occur on the SJNF within potentially suitable habitat for Pagosa skyrocket include livestock grazing, installation and/or maintenance of utility corridors, mineral and energy development, vegetation management, fire management, road use and maintenance, and management of noxious weeds.

Drought and climate change may also impact potentially suitable habitat for Pagosa skyrocket on the SJNF. The impacts of each activity would vary and are dependent on factors such as location, timing, and intensity. Specific conservation measures (standards, guidelines, and leasing stipulations) would be adopted as part of the LRMP to help eliminate, reduce, or mitigate the potential impacts from these activities. These are discussed in more detail below.

**Livestock Grazing:** Permitted livestock grazing occurs across much of the suitable habitat for Pagosa skyrocket on the SJNF. Livestock grazing is also permitted on portions of the O'Neal Hill critical habitat unit, which is part of a currently active allotment, and on the Eightmile Mesa critical habitat unit, which is part of a currently vacant allotment. Impacts from grazing to potentially suitable habitat could include soil disturbance from trampling and a potential increase in noxious weed due to this soil disturbance. Impacts to Pagosa skyrocket from livestock grazing would be minimized by the application of LRMP Standard 2.2.63, which requires that permitted livestock grazing in habitat occupied by federally listed plant species or in critical habitat for federally listed plant species, and be managed to prevent adverse effects to those federally listed plant species and their habitat. This standard would prevent the destruction of flowering plants, rosettes, and seeds from heavy livestock use and would prevent adverse effects to the native plant communities used by potential pollinators. Guidelines are also in place stating that long-term impacts to suitable habitat for federally listed plant species should be minimized.

**Installation and Maintenance of Utility Corridors:** Much of the suitable habitat for Pagosa skyrocket occurs within the public and private lands intermix, where the public need to access private land often requires the installation of new utilities and/or the maintenance of existing utilities. This typically requires ground-disturbing activities such as digging trenches to install utilities, replacement of power poles, or motorized access to aboveground utilities for maintenance. Threats to Pagosa skyrocket from these activities would be minimized by the application of LRMP Guideline 2.2.66, which states that new ground-disturbing activities should be managed to avoid habitat occupied by federally listed plant species in order to prevent the loss of habitat and prevent adverse effects to federally listed plant species. This guideline would prevent the direct mortality and permanent loss of habitat for Pagosa skyrocket. In addition, Guideline 2.2.71 would help prevent adverse impacts to habitat by avoiding or mitigating soil erosion or compaction on Mancos Shale. Changes to the primary constituent elements needed to support the life-history processes of this species, particularly those related to suitable plant communities and habitat for pollinators, would also be minimized by Guideline 2.2.71, as well as by Guideline 2.2.80, which states that persistent non-natives and invasive exotic plant species should be avoided in seed mixes.

Mineral and Energy Development: The known population of Pagosa skyrocket and the designated critical habitat for this species are not currently under lease for mineral and energy development. Only 4% of the suitable habitat for Pagosa skyrocket on SJNF lands is currently under lease. Mineral and energy development often requires ground disturbing activities which could potentially impact Pagosa skyrocket and its habitat. In areas already under lease, but not yet developed, standard lease terms can be used to move the location of a well or access road prior to development to help prevent or minimize impacts to this species, its suitable habitat, and its designated critical habitat. There is also a guideline in the LRMP that states that activities should be managed to minimize long-term impacts to the suitable habitat of federally listed plant species. These design criteria can be used to condition the approval of development on existing leases. In new lease areas, impacts to this species and designated critical habitat would be prevented by application of the NSO stipulation in areas occupied by federally listed plant species and within a 650-foot buffer around those lands. It also includes an NSO stipulation for SBAs. These stipulations would prevent the direct mortality of Pagosa skyrocket, prevent the permanent loss of habitat for Pagosa skyrocket, and prevent adverse effects to the native plant communities in occupied habitat used by potential pollinators.

**Vegetation Management:** Vegetation management (such as mechanical thinning and fuels treatments) may occur within suitable habitat for Pagosa skyrocket. Impacts to Pagosa skyrocket and its habitat are possible from these activities but would be minimized through the application of various standards and guidelines designed to 1) avoid new ground-disturbing activities in habitat occupied by federally listed plant species (Guideline 2.2.66); 2) minimize adverse effects to habitat for federally listed plant species (Guideline 2.2.67); 3) minimize impacts to Mancos Shale soil (Standard 2.2.61 and Guideline 2.2.71); 4)

provide habitat for pollinators by retaining adequate slash (Guideline 2.2.73); and 5) prevent establishment of non-native plant species by avoiding the use of non-native and invasive exotic plant species during revegetation projects (Guideline 2.2.80). These standards and guidelines would minimize impacts to both occupied and unoccupied habitat.

Management-ignited Fires: Management-ignited fires may also occur within suitable habitat for Pagosa skyrocket. The standards and guidelines listed above for vegetation management projects would also apply to management-ignited fire, and would help prevent or minimize impacts to this species and its habitat. In addition, management-ignited fires are typically conducted in the spring (March, April, or May), prior to flowering of Pagosa skyrocket, or in the fall (October and November), after flowering and seed set, which should help minimize impacts to flowering individuals that may be present. Managementignited fires would not impact the barren shale where this species can be found, but could impact the other vegetation types that provide habitat. However, the more open areas, and small, sparsely vegetated areas in these vegetation types with less than 5% or 10% cover where Pagosa skyrocket is typically found would likely experience low fire intensity and low burn severity, thus minimizing impacts to suitable habitat and any individuals that may be present. Prior to Euro-American settlement in the 1880s. low-intensity fire was a common disturbance event in the vegetation types where Pagosa skyrocket is found. Low-intensity management-ignited fires are not severe or continual disturbance, but instead would be considered light to moderate or intermittent or discontinuous disturbance, which is one of the primary constituent elements needed to support the life-history processes of this species. Impacts to pollinators and their habitat are also possible since many fine fuels on the ground surface are consumed during burning. However, this impact would be localized and of relatively short duration. There are typically many patches of varying size that are left unburned after management-ignited fires, so many twigs and branches would still be available to pollinators. In addition, only a very small percentage of pollinator habitats within suitable Pagosa skyrocket habitat would be impacted by management-ignited fires in any given year. If fireline is needed to provide a control feature for a management-ignited fire, impacts would be minimized in both occupied and unoccupied habitat by the application of LRMP Guidelines 2.2.66 and 2.2.67. In addition, the disturbance caused by building fireline would impact only a very small fraction of suitable habitat for this species and would be considered an intermittent or discontinuous disturbance, which is appropriate to support the life-history processes of this species.

**Wildfires:** Impacts to suitable Pagosa skyrocket habitat from wildfires would be similar to those described for management-ignited fires, but more impacts could occur from suppression activities such as building fireline and mop-up activities. Naturally ignited fires in the public and private lands intermix and adjacent areas are usually suppressed as quickly as possible and are therefore typically less than a few acres in size, making the impacts of wildfire suppression very localized. As with management-ignited fires, the intermittent or discontinuous disturbance caused by building fireline would impact only a very small fraction of suitable habitat for this species with impacts from the construction of fireline being minimized in both occupied and unoccupied habitat by the application of LRMP Guidelines 2.2.66 and 2.2.67.

Road Use and Maintenance: Numerous roads currently exist within suitable Pagosa skyrocket habitat on the SJNF, including U.S. Highway 160, NFS roads, and permitted roads and driveways used to access private land. Impacts to suitable habitat from the maintenance of these roads are possible. In habitat occupied by Pagosa skyrocket, this impact can be mitigated using LRMP Guideline 2.2.66, which states that new ground-disturbing activities should be managed to avoid habitat occupied by federally listed plant species in order to prevent the loss of habitat and prevent adverse effects to federally listed plant species. In unoccupied habitat, impacts from periodic road maintenance would be considered intermittent or discontinuous disturbance, which is appropriate to support the life-history processes of this species. Loss of unoccupied habitat would be mitigated by the application of Guideline 2.2.67, which minimizes adverse effects to habitat for federally listed plant species by minimizing effects from ground-disturbing activities. Impacts from related activities, such as seeding roadsides to prevent erosion and weed establishment, could also impact suitable habitat. These potential impacts would be mitigated by the application of Guideline 2.2.80, which would help reduce competition with non-native species.

**Noxious Weed Treatment:** Noxious weeds are commonly found on roadsides and other disturbed areas that are considered suitable habitat for Pagosa skyrocket. Treatment of noxious weeds in unoccupied suitable habitat would minimize the amount of non-natives species that are present in suitable habitat, thus helping preserve native plant communities that provide habitat for potential pollinators. In habitat occupied by federally listed plant species, or in critical habitat for these species, LRMP Standard 2.2.63 requires that noxious weed treatment be managed to prevent adverse effects to those species and their habitat. Weed treatment crews would be trained to identify Pagosa skyrocket and its habitat and instructed to avoid this species during treatment activities.

**Drought and Climate Change:** In addition to the specific management actions discussed above, drought and climate change may also impact potentially suitable habitat for Pagosa skyrocket. Although the SJNF has no control over the intensity or timing of these events, a management emphasis on maintaining resilient plant communities and ecosystems would help mitigate potential adverse effects from drought and climate change. These include managing for productive soils and native plant communities (LRMP Desired Conditions 2.2.2, 2.2.6, 2.2.13, 2.2.15, 2.2.32, 2.2.33, 2.2.39, 2.2.40, and 2.2.41), restricting the use of non-native plant species that compete with federally listed plant species for resources and space (Guideline 2.2.80), planning for long-term seed storage of vulnerable plant species (Objective 2.2.55), and prohibiting heavy livestock grazing that could adversely impact suitable Pagosa skyrocket habitat and other native plant communities used by pollinators (Standard 2.2.63, Guidelines 2.2.66 and 2.2.67).

Critical habitat for Pagosa skyrocket was designated for the purpose of conserving this species and its habitat. As stated in Section 3 of the ESA, these areas may require special management considerations or protection. This is accomplished in the LRMP through the adoption of standards, guidelines, and leasing stipulations discussed above. The management activities that have potential to occur within the O'Neal Hill, Eightmile Mesa, and Dyke critical habitat units, including livestock grazing, road use and management, vegetation treatments, or oil and gas development, must abide by the direction found in the LRMP. The effects of these activities have been previously discussed.

In addition to the protections offered by management of critical habitat units, and the adoption of the standards, guidelines, and leasing stipulations found in the LRMP, some protections to Pagosa skyrocket are also offered through the designation of special areas and unique landscapes in MA 2. The O'Neal Hill SBA, which was designated in order to protect and preserve Pagosa bladderpod (*Lesquerella pruinosa*) (a USFS Region 2 sensitive plant species) and its habitat, is one of these areas. Although this SBA was not established specifically for Pagosa skyrocket, it contains similar Mancos shale habitat and the other primary constituent elements needed to support the life-history processes of Pagosa skyrocket. The protections provided by the SBA would help maintain self-sustaining populations of Pagosa skyrocket and the native plant communities used by potential pollinators of this species.

#### **Cumulative Effects**

It is likely that past and current activities such as development, the construction and maintenance of roads and utility lines, and livestock grazing have all contributed to diminished distribution and a loss of habitat for Pagosa skyrocket across its entire global range. Approximately 70% of all suitable habitat for this species, and 98% of known populations, occur on commercial, residential, municipal, and agricultural properties on non-federal lands where there are few, if any, regulatory mechanisms available to address the primary threats to this species. Reasonably foreseeable future activities on non-federal land include continued commercial and residential expansion around Pagosa Springs, road maintenance and expansion, continued ROW maintenance, and exotic species control. Plans for development in and around Pagosa Springs affect almost the entire global range of Pagosa skyrocket and a majority of its suitable habitat.

The actions proposed on SJNF and TRFO lands under the Preferred Alternative would contribute to the past, present, and future impacts to Pagosa skyrocket described above, and thus contribute to cumulative impacts to this species. However, these impacts would be minimized by the application of standards, guidelines, leasing stipulations, and special area designations, as well as project-level mitigation.

#### Determination

Activities on the SJNF and TRFO authorized under the LRMP, including livestock grazing, installation and/or maintenance of utility corridors, mineral and energy development, vegetation management, fire management, road use and maintenance, and noxious weed control may affect, but are not likely to adversely affect Pagosa skyrocket and its suitable habitat, and would not result in the destruction or adverse modification of designated critical habitat for Pagosa skyrocket. The effects of these activities would be minimized through the application of the standards, guidelines, and leasing stipulations, as described under direct and indirect impacts. In addition, impacts to Pagosa skyrocket, its suitable habitat, and designated critical habitat would be analyzed on a project-specific basis and impacts minimized with the development of project specific design criteria.

# Knowlton's cactus (Pediocactus knowltonii)

## **Background**

Knowlton's cactus is a diminutive ball cactus measuring up to 2.2 inches tall with solitary or clustered stems and pink flowers. It has very short spines and flowers in late April to early May (USFWS 2010). The most common pollinators seen on the flowers are small native bees, but pollination for Knowlton's cactus has not been specifically studied and very little is actually known about pollination of this species (USFWS 2013f).

Knowlton's cactus was listed as endangered under the ESA on October 29, 1979 (USFWS 1985). In 1985, the Knowlton Cactus Recovery Plan was completed by the USFWS. The two main goals of the 1985 recovery plan were to protect populations from present and future human threats, and ensure the maintenance of vigorous self-sustaining population in the species natural habitat (USFWS 1985). The 5-year review completed in 2010 recommended that the recovery plan be revised to incorporate new information on biology, ecology, management recommendations, and objectives, and that measurable recovery criteria for down and delisting of the species be developed, which address all listing factors relevant to the species. To date, the recovery plan has not been revised (USFWS 2010). No critical habitat for this species has been designated.

#### Status and Distribution

Knowlton's cactus is currently known from a single natural population of approximately 6,100 plants within a 25-acre preserve owned by TNC in northern San Juan County, New Mexico. A few cacti (approximately 55) also occur on adjoining BLM land within approximately 33 feet of the TNC boundary. In 1986, 1987, and 1995, numerous Knowlton's cactus were transplanted to a nearby site owned by the Bureau of Reclamation in an attempt to establish a new population. Only two new plants were recruited into this population from 1987 to 2006, with rodent or rabbit predation killing most of the transplanted cacti.

By 2007, with mortality consistently exceeding recruitment, only a few individuals remained, and the attempt was deemed a failure. In 1991, another transplant was attempted on BLM land within the Reese Canyon Area of Critical Environmental Concern. By 2008, only three new plants had been recruited into this population, and the remaining transplanted cacti were being seriously impacted by rodent or rabbit predation. As of 2008, only 48 of the originally transplanted cacti remained alive, making the long-term persistence at this transplant site unlikely (USFWS 2010).

Knowlton's cactus is not known to occur in Colorado, although inaccurate reports of the species occurring in Colorado are still common in federal, state, and conservation organization literature and websites (Glenne 2013; USFWS 2010). However, the known population of Knowlton's cactus is within 30 meters of the Colorado border (USFWS 2010), and there is suitable habitat for the species on both private and federal lands in La Plata and Archuleta Counties in southern Colorado (Glenne 2013), including lands managed by the SJNF.

At the time of its listing in 1985, there were an estimated 7,000 plants in the natural population (USFWS 1985). Population surveys begun in 1992 showed that the population increased through the late 1980s and early 1990s to a peak of approximately 14,000 individuals in 1994 (USFWS 2010). Since 1994,

however, the population has been gradually but steadily declining. Mortality in this population has consistently exceeded recruitment, with relatively few new seedlings becoming established since 1994. Both drought and predation by rodents seem to be contributing factors in this trend. The most recent population estimates from 2008 estimated that 6,100 cacti were present on the site (Sivinski 2008; USFWS 2010).

#### Habitat

The current known population of Knowlton's cactus is found on varying aspects between 6,200 to 6,300 feet in elevation, on alluvial deposits with pea to cobble-sized gravel overlying the San Jose Formation. These rolling, gravelly hills are dominated by a pinyon-juniper-sagebrush vegetation community.

Although not known to occur in Colorado, an analysis of best available geology, soils, and vegetation information shows that there is potentially suitable habitat present in both La Plata and Archuleta Counties in southern Colorado (Glenne 2013). Surveys for this species and field reconnaissance of some of the areas considered most likely to contain suitable habitat for this species were done by the USFS on May 9 and 17, 1995. This included Ignacio Creek, Skull Canyon, Goose Creek, Turkey Creek, Spring Creek, and Salt Canyon. No Knowlton's cactus was found during these surveys, and it was determined that these areas did not contain suitable habitat based on the lack of pinyon-juniper-sagebrush communities in these areas and the lack of cobbly riverine alluvial soils (Dickerson 1995). Surveys of potentially suitable habitat have also been done on nearby lands managed by the Bureau of Indian Affairs, but the species has never been found (Friedley 2013).

#### Direct and Indirect Effects

The 5-year review of Knowlton's cactus listed several potential threats to Knowlton's cactus, including continued oil and gas exploration, illegal collection by cactus enthusiasts, predation by rabbits or rodents, and continued and worsening drought conditions due to changes in climate. Management activities that may occur on the SJNF under the Preferred Alternative within potentially suitable habitat for Knowlton's cactus include livestock grazing, minerals and energy development, and vegetation management. The impacts of each activity would vary and are dependent on factors such as location, timing, and intensity. Specific conservation measures (standards, guidelines, and leasing stipulations) would be adopted as part of the LRMP to help eliminate, reduce, or mitigate the potential impacts from these activities. These are discussed in more detail below.

**Livestock Grazing:** Permitted livestock grazing occurs within portions of the potentially suitable habitat for Knowlton's cactus on the SJNF. Impacts from grazing to potentially suitable habitat could include soil disturbance from trampling and a potential increase in noxious weed due to this soil disturbance. Impacts to Knowlton's cactus and its habitat from permitted livestock grazing would be minimized by the application of Standard 2.2.66, which requires that permitted livestock grazing in habitat occupied by federally listed plant species, or in critical habitat for federally listed plant species, and be managed to prevent adverse effects to those federally listed plant species and their habitat. Guidelines are also in place stating that long-term impacts to suitable habitat for federally listed plant species should be minimized.

Mineral and Energy Development: Approximately 38% of the area considered suitable habitat for Knowlton's cactus is currently under lease for potential mineral and energy development. Mineral and energy development often requires ground-disturbing activities that could potentially impact Knowlton's cactus and its habitat. In areas already under lease, but not yet developed, standard lease terms can be used to move the location of a well or access road prior to development to help prevent or minimize impacts to this species and its suitable habitat. There is also a guideline in the LRMP that states that activities should be managed to minimize long-term impacts to the suitable habitat of federally listed plant species. These design criteria can be used to condition the approval of development on existing leases. In new lease areas, impacts to this species would be prevented by application of the NSO stipulation in areas occupied by federally listed plant species, and within a 650-foot buffer around those lands. The NSO stipulation for federally listed species would be applied under each alternative. These stipulations

would prevent both the direct mortality of Knowlton's cactus and the permanent loss of habitat for the species.

**Vegetation Management:** Vegetation management (such as mechanical thinning and fuels treatments) may occur within potentially suitable habitat for Knowlton's cactus. Impacts to Knowlton's cactus and its habitat are possible from these activities but would be minimized through the application of various standards and guidelines designed to minimize new ground-disturbing activities in habitat occupied by federally listed plant species (Guideline 2.2.66) and prevent establishment of non-native plant species by avoiding the use of non-native and invasive exotic plant species during revegetation projects (Guideline 2.2.80). These standards and guidelines would minimize impacts to potentially suitable habitat for Knowlton's cactus.

## **Cumulative Effects**

Past and present activities that have impacted Knowlton's cactus include continued oil and gas exploration, illegal collection by cactus enthusiasts, predation by rabbits or rodents, and continued and worsening drought conditions due to changes in climate. Past and current activities on the SJNF and TRFO that could impact Knowlton's cactus include livestock grazing, vegetation management projects, and oil and gas leasing. The actions proposed on SJNF and TRFO lands under the Preferred Alternative could contribute to the past, present, and future impacts to Knowlton's cactus described above, and thus contribute to cumulative impacts to this species. However, these impacts would be minimized by the application of standards, guidelines, and leasing stipulations, as well as project-level mitigation.

#### Determination

Actions associated with the Preferred Alternative **may affect**, **but are not likely to adversely affect** Knowlton's cactus and its suitable habitat. The application of the standards, guidelines, and special leasing stipulations described above should minimize adverse effects to Knowlton's cactus and its potential habitat on the SJNF. In addition, this species would continue to receive consideration during project-level planning for activities proposed in or near potential Knowlton's cactus habitat, which would include measures designed to avoid impacts to this species and its habitat as necessary.

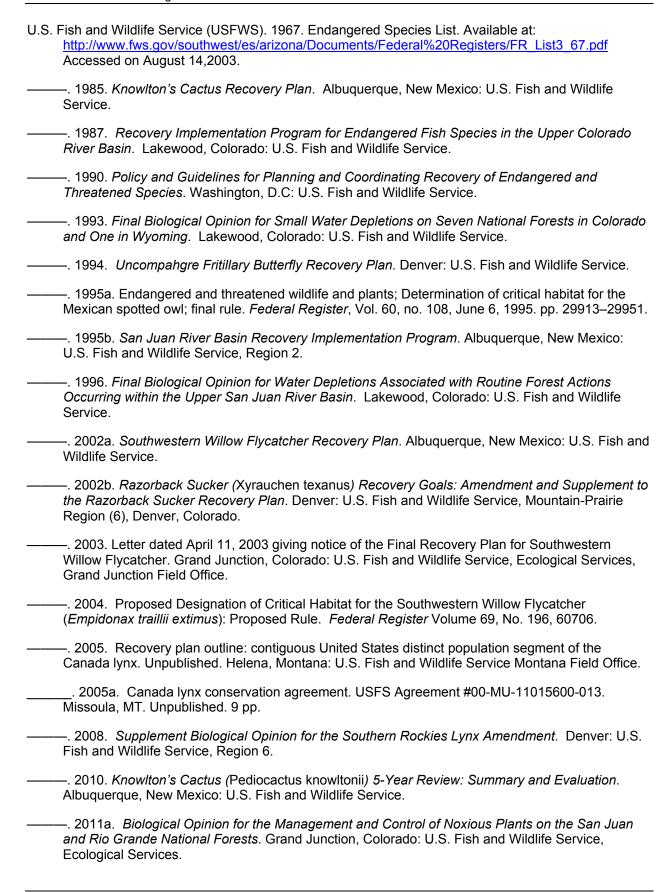
# **CHAPTER 3 – REFERENCES**

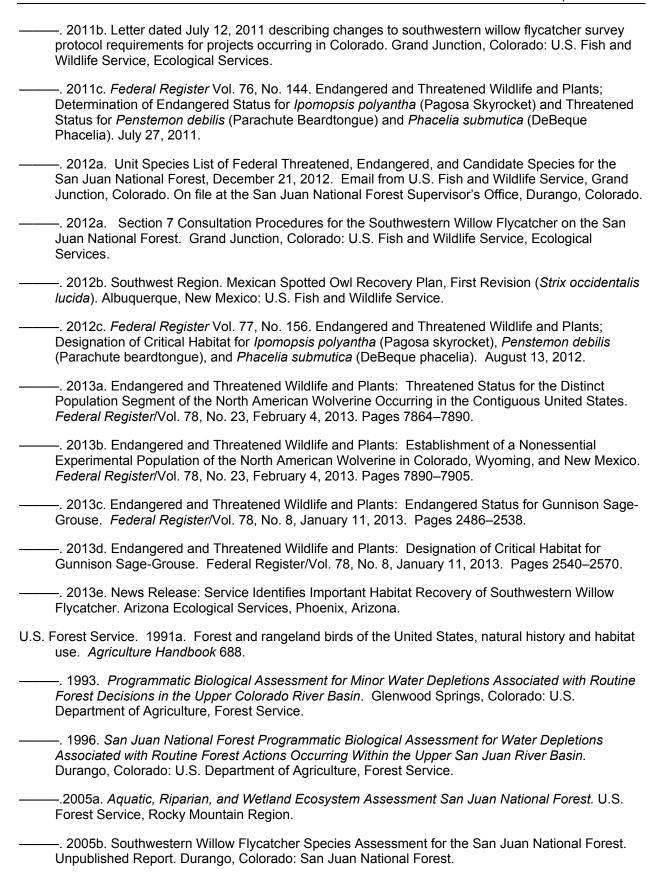
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# APPENDIX J.A – LRMP SECTION 2.1- SPECIES CONSERVATION

# 2.1 Ecological Framework and the Conservation of Species

The following strategies, concepts, and components are used in this LRMP to establish an ecological framework for the conservation and management of ecosystems, habitats, and species. These are overarching strategies that have relevance to a wide range of program areas and agency actions occurring on TRFO and SJNF lands. They are especially important to the four program areas of terrestrial ecosystems and plant species, terrestrial wildlife, riparian and wetland ecosystems, and aquatic ecosystems (Sections 2.2–2.5).

#### Sustainable Ecosystem Strategy

Ecosystems are communities of living organisms interacting with each other and with their physical environment (Kaufmann et al. 1994). They are dynamic systems that change in response to succession, climate, and the effects of disturbances, including those caused by fire, insects, disease, drought, wind, and humans. Humans are an integral part of ecosystems and depend on them for their short- and long-term well-being. In order to meet the social and economic needs of future generations, ecosystems are to be managed for sustainability. To ensure the long-term sustainability of ecosystems, humans must manage within the physical and biological capabilities of the land, maintain all of the ecological components and processes, and not irreversibly alter ecosystem integrity and resilience. The concept of sustainability is a fundamental component of the LRMP and is guided by the Multiple-Use Sustained-Yield Act (MUSY) and the FLPMA. The MUSY directs that federal lands are managed in a manner that provide a framework of social, economic, and ecological conditions that sustain native ecosystems, support a diversity of native plant and animal species, and provide a continuous flow of goods and services to the nation. The FLPMA directs that public lands be managed based on multiple use and sustained yield, as well as the protection of other values including, but not limited to, scenic, historical, ecological, environmental, air and atmospheric, and water resource values.

The MUSY identifies three interrelated and interdependent elements of sustainability for the USFS: social, economic, and ecological. Social and economic sustainability is associated with the provision of goods and services from the TRFO and SJNF to people and communities over the long term. Sustainability takes into account the social and economic conditions of the planning area, including recreational opportunities, multiple uses that contribute to local and regional economies, and cultural resources. Ecological sustainability is intended to provide the ecological conditions that maintain or restore the diversity of native ecosystems and natural disturbance processes. This in turn will maintain suitable habitats for a wide range of plant and animal species and provide for the diversity and viability of plant and animal species, populations, and communities. When applied effectively, the sustainable ecosystems strategy will result in ecological conditions similar to those under which native species evolved. Achieving these conditions offers some assurance against further losses of biodiversity (Seymore and Hunter 1999). Managing for ecological sustainability is intended to ensure that ecosystems of the TRFO and SJNF continue to maintain the ecological conditions necessary to provide goods and services needed by people and communities, now and in the future. This strategy is also consistent with the management of public lands as prescribed under the FLPMA.

The sustainable ecosystems strategy of the TRFO and SJNF includes 1) protected area designation and preservation (a coarse-filter approach), 2) ecosystem management using sustainable ecosystem concepts, 3) the development and application of plan components (desired conditions, objectives, standards, and guidelines) that provide a framework for the management and preservation of ecosystems, and 4) monitoring the effects of management activities on the TRFO and SJNF and the application of adaptive management principles. Effective monitoring and evaluation of how management activities are affecting ecosystems and species, and the correct application of adaptive management principles, will be critical to maintaining functional, sustainable ecosystems and addressing the needs of dependent species. Refer to Chapter 4 for a description of the SJNF and TRFO monitoring components.

# Disturbances and the Historical Range of Variability

Major disturbances, including those caused by fire, insects, disease, drought, wind, floods, and humans, can have a profound effect toward shaping the composition, structure, and function of ecosystems at multiple scales and in creating a heterogeneous pattern of vegetation communities and habitats across the planning area. Disturbances vary in magnitude, size, and frequency, some of which humans have little control over. Multiple disturbances can interact in complex ways and often act in concert, which can predispose ecosystems to more intense effects. Many of these disturbances have significant long-term effects on terrestrial, riparian area and wetland, and aquatic ecosystems. It is not a question of whether disturbances will happen, but when, where, and at what scale they will happen. Disturbances can have a major influence (adverse or beneficial) on the agencies' ability to achieve the desired conditions and objectives of the LRMP.

The Historical Range of Variability (HRV) of ecosystems is determined by major disturbances and also less dramatic changes occurring over a long period of time. HRV is an important concept used in the LRMP to guide the management of ecosystems and to achieve ecosystem sustainability. HRV provides a tool used to gain a better understanding of complex ecological systems. It can be used to establish an ecological baseline, allowing managers to identify trends, assess the need for ecological restoration, and evaluate the consequences of management activities (Kaufmann et al. 1994; Kulakowski and Veblen 2006; Landres et al. 1999; Moore et al. 1999; Swetnam et al. 1999; Veblen and Donnegan 2005). HRV describes a dynamic set of boundaries within which most native biota have persisted through time and across space (Landres et al. 1999; Swetnam et al. 1999).

Using a reference period of indigenous settlement that occurred from the 1500s to the late 1800s, HRV first describes the range of ecological conditions that occurred on TRFO and SJNF lands under more "natural" disturbance regimes. Conditions occurring during this period represent those that existed prior to European-American settlement, which introduced sweeping ecological changes due to activities such as large-scale timber harvest, livestock grazing, fire suppression, dams, consumptive water uses, and roads.

The HRV is then used to evaluate the current ecological conditions of ecosystems on TRFO and SJNF lands by comparing them to the ecological conditions that occurred during the reference period. The HRV concept assumes that as ecological conditions depart from the range of historic conditions (primarily due to human actions), the risk of species loss increases (Duffy et al. 1999). Since native species evolved under HRV conditions, maintaining a full range of similar conditions will offer some assurance against the loss of biodiversity (Seymore and Hunter 1999). As reflected in the desired conditions, objectives, and standards and guidelines that follow, the intent is to use HRV to better describe and understand ecosystems within TRFO and SJNF lands and to help develop attainable LRMP components that are intended to protect and sustain ecosystems and species, while meeting a variety of public needs where possible. The intent is not to mandate that HRV conditions be achieved in all cases.

## **Protected Areas**

Protected areas are key components of the sustainable ecosystems strategy. Protected areas are lands especially dedicated to the protection and maintenance of biological diversity (International Union for Conservation of Nature 1994). They are large, mostly unaltered, undeveloped, and roadless lands that contain terrestrial, riparian area and wetland, and aquatic ecosystems at multiple scales. They serve as conservation reserves and refuges to protect the native biodiversity within them (Norton 1999; Noss 1991). They also provide wildlife movement corridors and landscape linkage areas that connect habitats and landscapes, which in turn facilitate the interaction of species.

Management objectives for protected areas on TRFO and SJNF lands include:

- Preserving habitats, ecosystems, and species in as undisturbed a state as possible;
- Conserving the area's biodiversity through protection, not through active management;
- Ensuring the integrity of its ecosystems; and
- Maintaining established ecological processes.

Establishing and preserving protected areas is a means to maintain ecosystem diversity, which presumably will protect the diversity and viability of native plant and animal species and communities, and the ecological processes occurring within those ecosystems. The maximum level of biodiversity will be preserved if the maximum diversity of habitats is represented in protected area networks (Noss and Peters 1995; Scott et al. 1993). The establishment and preservation of protected areas is analogous to the Nature Conservancy's (TNC) coarse-filter conservation approach, which is well-documented in the literature and has broad support in the scientific community (Hunter et al. 1988; Noss 1987; TNC 1982). Protected areas, which make up about 48% of public lands within the planning area, include wilderness areas, the Piedra Area, WSAs, research natural areas (RNAs), and CRAs (see Figure 2.1.1).

Unaltered, unroaded, high-elevation terrestrial, riparian, and wetland ecosystems are very well represented in protected areas on both SJNF and TRFO lands. These include alpine areas, spruce-fir forests, aspen forests, Thurber fescue mountain grasslands, riparian forests and shrublands, fens, and herbaceous riparian areas and wetlands. Unaltered, unroaded, mid-elevation ecosystems are also well represented in SJNF and TRFO protected areas. These include cool-moist mixed conifer forests, warm-dry mixed conifer forests, ponderosa pine forests, pinyon-juniper woodlands, mountain shrublands, Arizona fescue mountain grasslands, deciduous riparian forests and shrublands, and herbaceous riparian areas and wetlands. Unaltered, unroaded, low-elevation ecosystems are less common and not as well represented in protected areas in the planning area. These include sagebrush shrublands, semi-desert shrublands and grasslands, deciduous riparian forests, and hanging gardens. For aquatic ecosystems, both lotic (running water) and lentic (standing water) ecosystems are well represented throughout the network of protected areas in the planning area. However, these waters are almost exclusively cold water systems. Warm water systems are not well represented within the SJNF and TRFO protected areas.

#### Ecosystem Management

Ecosystem management is an important integrating component of the sustainable ecosystems strategy. Ecosystem management uses an ecological approach to blend the social, economic, and ecological needs and values to assure productive, sustainable ecosystems, perpetuate natural disturbance regimes, and allow human uses that do not result in long-term ecological degradation (Kaufmann et al. 1994; Noss and Cooperrider 1994). Outside the designated protected areas described above, a wide range of public uses and management activities occur on TRFO and SJNF lands. For these lands, the application of sustainable ecosystem management principles is critical to maintaining ecosystems, providing for biological diversity, and maintaining populations of fish, wildlife, and plant populations. Ecosystem management on SJNF and TRFO lands, which uses the HRV for reference, will be implemented by maintaining or restoring the composition (plant species, animal species, and vegetation types), structure (size, density, and arrangement of live and dead vegetation, stream channel attributes), function (ecological processes and disturbances), and physical environment (soils, water, and geomorphology) of ecosystems. Ecological assessments specific to the SJNF and TRFO are used to describe current ecological conditions in and adjacent to the planning area (Romme et al. 2009; USFS 2005a). The ecosystem management approach will be implemented at multiple scales using terrestrial, riparian area and wetland, and aquatic ecosystems as the primary analysis units. The approach is intended to protect and maintain these ecosystems and ensure the diversity and population viability of the majority of species within them.

# **Species Management Strategy**

Species that may not be adequately recognized or protected by the above ecosystems management approach, or whose specific habitat needs or other life requirements may not be fully met under the sustainable ecosystems strategy, will be given special management considerations, including the development of LRMP components that contribute to the conservation of those species. This species conservation approach is analogous to TNC's fine-filter approach that protects species with known conservation concerns (Hunter et al. 1988; Noss 1987; TNC 1982). The species conservation approach may be needed for species at risk of extinction, species that are highly vulnerable to disturbances, species whose habitat includes rare ecological components (rare soil types or geologic types) that occur at a very small scale, and species with unique hydrologic conditions. This approach may also be needed

for special status species whose key habitat components are directly affected by agency management activities.

## **Special Status Species and Management Indicator Species**

Special status species on TRFO and SJNF lands include federally listed species, species proposed for federal listing, candidate species for federal listing, Region 2 Regional Forester's sensitive species, and Colorado BLM State Director's sensitive species. Some of these species have immediate needs that may not be adequately recognized and addressed by the overall sustainable ecosystems strategy. As such, they are given special consideration, and additional LRMP components have been developed to address those special needs. In addition, current species-specific conservation plans and strategies are relied upon to address the needs of special status species. These plans and strategies are discussed within the applicable resource sections below and are analogous to TNC's fine-filter approach. LRMP components specific to special status species augment those components developed through the ecosystem management approach. A list of special status species can be found in Volume III, Appendix P.

USFS Management Indicator Species (MIS) serve several related functions in LRMP development and implementation. MIS are typically selected due to their responsiveness to land management activities and represent groups of species with similar needs. With these applications in mind, MIS are used to develop LRMP objectives for fish and wildlife populations and their habitats, analyze the degree to which LRMP alternatives meet those objectives, and ultimately monitor the effectiveness of LRMP implementation. Changes in MIS populations, or their habitats, may indicate how management has affected the composition, structure, or function of habitats and ecosystems, and help determine the need for change. The planning requirement to identify and address MIS is applicable only to NFS lands (36 CFR 219) and is not required by BLM planning regulations. The BLM does not identify MIS but instead monitors and reports on sensitive species populations as directed in BLM Manual 6840 (BLM 2008).

Species considered for inclusion as MIS on SJNF lands were developed using the following five categories:

- Endangered and threatened plant and animal species identified on state and federal lists:
- Species commonly hunted, fished, or trapped;
- Non-game species of special interest;
- Species with special habitat needs that may be influenced significantly by planned management programs; and
- Additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on water quality.

#### **Biological Diversity and Population Viability**

The maintenance of biological diversity and population viability on SJNF and TRFO lands are addressed directly or inferred under a variety of laws, regulations, and policies specific to each agency. These include the NFMA, the MUSY, the FLPMA, and the Endangered Species Act of 1973 (ESA). Some of the supporting federal regulations, departmental regulations, and departmental manual direction include 36 CFR 219.19, Forest Service Manual (FSM) 2620, FSM 2622.01, and U.S. Department of Agriculture (USDA) Departmental Regulation 9500-4.

For lands managed by the USFS, 36 CFR 219.19 specifically requires that "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area," and "[f]or planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure [sic] its continued existence is well distributed in the planning area." Regulation 36 CFR 219.26 requires that "[f]orest planning shall provide for diversity of plant and animal communities and tree species consistent with the overall multipleuse objectives of the planning area. Such diversity shall be considered throughout the planning process." In addition, the FLPMA specifies that special uses granted by the Secretary of Agriculture or the Secretary of the Interior are subject to terms and conditions that "minimize damage to fish and wildlife habitat and otherwise protect the environment." Agency actions should avoid or minimize impacts to

species whose viability has been identified as a concern. USFS actions must not result in loss of population viability or create significant trends toward federal listing (FSM 2670.32).

BLM Colorado's Standards for Public Land Health (BLM Manual H-4180-1) describe the resource conditions and acceptable management practices for BLM lands. Standards of land health are expressions of levels of physical and biological condition or degree of function required for healthy lands and sustainable uses, and define minimum resource conditions that must be achieved and maintained. Standards are applied on a landscape scale and relate to the potential of the landscape. Standard 2 requires that riparian habitat associated with perennial streams functions properly, provides habitat, provides biodiversity, and meets water quality standards. Standard 3 specifies that wildlife and fish communities are maintained at viable population levels commensurate with habitat potential. Standard 4 requires that special status species and their habitats are maintained and enhanced.

In addition, the BLM's Special Status Species Management Manual requires that methods and procedures be identified in land use plans that ultimately bring sensitive species and their habitats to a condition in which management under sensitive species policies is no longer necessary (BLM Manual Section 6840.2B).

The SJNF and TRFO sustainable ecosystems and species management strategies combine to provide a foundation for addressing the legal, regulatory, and policy requirements described above. The underlying assumption is that implementing a management strategy that maintains sustainable ecosystems, along with a species strategy that addresses the specific needs of selected species, will provide for species diversity and long-term population viability, in as much as species diversity and population viability can be tied to the management of local federal lands. These two strategies are implemented through the LRMP components, which provide a framework for the management and protection of ecosystems, populations, and individual species occurring on SJNF and TRFO lands.

For each of the aforementioned ecosystem categories (riparian area and wetland ecosystems, aquatic ecosystems, and terrestrial ecosystems), specific management direction has been developed that is intended to address the legal, regulatory, and policy requirements for species diversity and population viability described above. The process applied was to identify a range of key ecosystem elements, determine the importance of those elements to maintaining species diversity and population viability (e.g. limiting factors), define desired future conditions and land management objectives for those elements, and ensure that appropriate management standards and guidelines are in place that address the ecological needs of species and populations. In general, management standards have been developed for those elements determined to have an overriding influence on species diversity or long-term population viability, while other elements that have less influence are typically addressed through the application of guidelines.

# APPENDIX J.B – APPLICABLE LRMP MANAGEMENT DIRECTION (DESIRED CONDITIONS, MANAGEMENT OBJECTIVES, STANDARDS, GUIDELINES, AND LEASE STIPULATIONS)

#### **Desired Conditions**

- 2.2.1 The composition, structure, and function of terrestrial ecosystems are influenced by natural ecological processes, including disturbance events such as fire, infestations by insects or disease, winds, and flooding.
- 2.2.2 Non-climate ecosystem stresses (e.g., high road densities, water depletions, air and water pollution) are reduced to improve the resilience and resistance of ecosystems to the future dynamics of a changing climate.
- 2.2.3 Key ecosystems that are not functioning properly are realigned/restored/renovated to survive the near-future dynamics of changing climate.
- 2.2.4 Future biodiversity, especially for endangered, rare, or dwindling species, is protected in the face of a changing climate by safeguarding habitats, preserving genetic diversity, and cooperating with seed banking efforts that provide secure, long-term storage of plant genetic resources.
- 2.2.5 Terrestrial ecosystems have a diverse composition of desirable native plants that are vigorous and self-perpetuating. Invasive plant species are absent or rare.
- 2.2.6 All development stages of the forested terrestrial ecosystems are well represented at the landscape scale and occur within the ranges identified in Tables 2.2.1 and 2.2.2.
- 2.2.7 Old growth ponderosa pine, old growth pinyon-juniper and old growth warm-dry mixed conifer forests are more abundant, occupy more acreage, and are well distributed on SJNF and TRFO lands.
- 2.2.8 Aspen forests display larger patches of the young-development stage.
- 2.2.9 Terrestrial ecosystems, including habitat for special status plant species, are productive, sustainable, and resilient, and provide goods and services over the long-term.
- 2.2.10 Forested terrestrial ecosystems display a Fire Regime Condition Class of 1.
- 2.2.11 Canyon escarpments, and the terrestrial ecosystems that occur on them, serve as refugia for native biota. These escarpments are associated with the following canyons: Lower Dolores River, Wild Steer, Coyote Wash Spring, McIntyre, Summit, Big Glade, Lake, Doe, Narraguinnep, Cabin, Ferris, Salter, Spruce Water, and Lost. They also include the Mesa Verde Escarpment.
- 2.2.15 Forested terrestrial ecosystems have stand structures and tree species composition that offer resistance and resilience to changes in climate, including extreme weather events, or epidemic insect and disease outbreaks.
- 2.2.16 Non-forested terrestrial ecosystems have community structure and species composition that offer resistance and resilience to changes in climate, including extreme weather events, or epidemic insect and disease outbreaks
- 2.2.17 Local seeds of desirable native plant species are available for revegetation and restoration efforts.

- 2.2.18 Suitable habitats for species vulnerable to climate change exist and serve as seed sources for revegetation and restoration efforts.
- 2.2.19 The SJNF and TRFO forested ecosystems provide net positive carbon storage.
- 2.2.20 Five-needle pine species (southwestern white pine [Pinus strobiformus], limber pine [P. flexilis], and bristlecone pine [P. aristata]) are maintained as a component of forested ecosystems.
- 2.2.21 High-elevation stands dominated by aspen (Populus tremuloides) will be maintained or increased over time to ensure the persistence of aspen on the landscape in light of declining aspen health and loss of aspen in lower elevations associated with a warmer and drier climate.
- 2.2.22 Ponderosa pine, warm-dry mixed conifer, and cool-moist mixed conifer forest stands that are in the old growth development stage and that have not been previously harvested are managed for their old growth values through active or passive management.
- 2.2.23 **Ponderosa Pine Forests** Ponderosa pine forests display variable density and structure. Most stands reflect uneven-age structure comprising variable-sized, even-aged clumps of trees. Clumps vary in size, ranging from as few as three trees to as many as 20 or more trees. Tree clumps vary in density from widely spaced large trees to tightly spaced small trees. Collectively, these forests contain multiple canopy layers. Between or surrounding these clumps are shruband/or grass/forb-dominated openings. Ponderosa pine seedlings and saplings are present, as are large old, yellow-barked ponderosa pine trees. The presence of other tree species—e.g., Douglas-fir, white fir, blue spruce (Picea pungens), or Rocky Mountain juniper (Juniperus scopulorum)—is infrequent to rare. The abundance and distribution of Gambel oak (Quercus gambelii) and other native shrubs in the understory of these forests is variable and includes small and large patches of all size classes. Native grasses and forbs (including bunchgrasses, Arizona fescue, muttongrass [Poa fendleriana], and mountain muhly [Muhlenbergia montana]) are present and well distributed in most ponderosa pine forests. Forest litter is common, though highly variable in depth and extent due to fire. Invasive plant species are absent or rare. Presence of snags or large wood (on the ground) is also highly variable due to fire. Low-intensity, highfrequency surface fires are common in most ponderosa pine forests (with frequencies ranging from about 12 to 30 years).
- 2.2.24 Warm-Dry Mixed Conifer Forests Warm-dry mixed conifer forests display variable density and structure, similar to ponderosa pine forests, with added complexity in species composition. Most stands reflect uneven-age structure composed of variable-sized, even-aged clumps of trees. Some have open canopies with widely spaced trees, especially on warmer aspects; some are dense with more closed canopies (e.g., on cooler aspects). Composition is dominated by ponderosa pine. Douglas-fir is a typical minor component. Trees range from young to old. White fir, blue spruce, or limber pine may be present, but infrequent. Shrub- and/or grass/forbdominated openings are common. The abundance and distribution of Gambel oak and other native shrubs in the understory of these forests is variable, and includes small and large patches of all size classes. Native grasses and forb (including tall bunchgrasses) are common and well distributed in most warm-dry mixed-conifer forests. Invasive plant species are absent or rare. Forest litter is common, though variable in depth and extent due to fire. Presence of snags or large wood (on the ground) is also variable due to fire. Low-intensity, surface fires occur in most warm-dry mixed conifer forests (with frequencies ranging from about 18 to 28 years). Tree species composition is closely tied to fire frequency, with Douglas-fir and white fir (or blue spruce) increasing during longer fire-free periods, and ponderosa pine increasing during shorter fire-free periods.
- 2.2.25 **Cool-Moist Mixed Conifer Forests -** Cool-moist mixed conifer forests display variable stand structures and species composition. Most are dense with closed canopies and multiple canopy layers. Tree species composition includes an abundance of Douglas-fir trees (ranging from young to old); other species include white or subalpine fir (Abies lasiocarpa), blue or Engelmann spruce (Picea engelmannii), aspen, or limber pine. Patches of cool-moist mixed conifer forest, ranging

from small to large, are distributed across the landscape. The canopy cover of shrubs in the understory of these forests is highly variable. Native grasses and forbs are common and well distributed in most cool-moist mixed conifer forests. Forest litter is common and well distributed. Invasive plant species are absent or rare. Snags and large wood (on the ground) are abundant in late successional stages. Mixed-severity fires occur in most cool-moist mixed conifer forests (with frequencies of about 144 years). All development stages of these forests are well represented.

- 2.2.26 Spruce-Fir Forests Spruce-fir forests display variable stand structures and species composition. Engelmann spruce is generally dominant; subalpine (or corkbark) fir makes up a lesser, but common, component. Bristlecone pine (Pinus longaeva), limber pine, aspen, white fir, or Douglas-fir are infrequent to rare and usually found on warmer, drier aspects. Most spruce-fir forests are dense with closed canopies and multiple canopy layers. Patches of spruce-fir forest, ranging from small to large, are distributed across the landscape. The canopy cover of shrubs in the understory of these forests is highly variable. High-elevation spruce-fir forest can have bristlecone pine, but is rare. Native grasses and forbs are common and well distributed in most spruce-fir forests. Forest litter is common and well distributed. Invasive plant species are absent or rare. Snags and large wood (on the ground) are abundant in most development stages. High-intensity, stand-replacement fires can occur in most spruce-fir forests (with frequencies longer than 200 years); most fires are of limited scale and variable intensity. All development stages of these forests are well-represented.
- 2.2.27 Aspen Forests Aspen forests display simple to variable stand structures—generally simple where conifer is rare or absent or variable where conifer comprise a substantial portion (up to 49% of the canopy cover). Patches of aspen, ranging from small to large, are distributed across the landscape. Aspen is infrequent to rare in the lowest- and highest-elevation forests (ponderosa pine and spruce-fir, respectively), and common throughout mixed conifer forests. The canopy cover of shrubs in the understory of these forests is highly variable. Native grasses and forbs are abundant and well distributed in most aspen and aspen-conifer forests. Forest litter is common and well distributed. Invasive plant species are absent or rare. Snags and large wood (on the ground) are abundant in late successional stages. Fire frequency in aspen stands is about 140 years. All development stages of these forests are well-represented.
- 2.2.28 Pinyon-Juniper Woodlands Pinyon-juniper woodlands display variable stand structures. Some have open structures with widely spaced trees; others are dense with high canopy covers. Most stands are uneven aged. Tree species composition varies in pinyon pine (Pinus edulis) and/or juniper (Juniperus sp.) abundance, ranging from young to old. The canopy cover and size of Gambel oak, sagebrush (Atriplex sp.), and other shrubs in the understory of these forests is variable. Native grasses and forbs are present and well distributed. Biological soil crusts and litter are common and well distributed on most sites. Invasive plant species are absent or rare. Highintensity, stand-replacement fires occur in most pinyon-juniper woodlands (with frequencies of 100 to 123 years).
- 2.2.29 **Mountain Shrublands** Mountain shrublands display variable stand structures. Most are dense with high canopy cover; others are open with widely spaced shrubs. Gambel oak and other deciduous native shrubs (including mountain mahogany [Cercocarpus montanus], serviceberry [Amelanchier sp.], chokecherry [Prunus virginiana], fendlerbush [Fendlera rupicola], and squaw apple [Peraphyllum ramosissimum]) are abundant and well distributed. Native grasses and forbs are abundant and well distributed. Invasive plant species are absent or rare. Litter is common and well distributed. High-intensity, replacement fires occur in most mountain shrublands.
- 2.2.30 **Sagebrush Shrublands** Sagebrush shrublands display variable stand structures. Some are open with widely spaced shrubs; others are dense. Some large patches are present. Sagebrush and other native shrubs are abundant and well distributed. Native perennial grasses (including Indian ricegrass [Oryzopsis hymenoides], galleta [Pleuraphis sp.], western wheatgrass [Pascopyrum smithii], and needle and thread [Hesperostipa comata]) are abundant and well distributed. Encroachment of pinyon and juniper trees is absent or rare. Invasive plant species

- are absent or rare. Biological soil crusts are common and well distributed on many sites. High-intensity, replacement fires occur in most sagebrush shrublands.
- 2.2.31 Semi-Desert Shrublands Semi-desert shrublands are dominated by native shrubs that could include shadscale saltbush (Atriplex confertifolia), winterfat (Krascheninnikovia lanata), fourwing saltbush (Atriplex canescens), plains pricklypear (Opuntia polyacantha), rubber rabbitbrush (Ericameria nauseosa), spiny hopsage (Grayia spinosa), greasewood (Sarcobatus sp.), and/or basin big sagebrush (Artemisia tridentata ssp. tridentata). Stand structures display open or moderately dense shrubs with native perennial grasses and forbs in the openings between them. Native grasses (including Indian ricegrass, galleta, western wheatgrass, and needle and thread) are abundant and well distributed. Invasive plant species and/or undesirable native plant species that are currently abundant on most sites are absent or rare. Biological soil crusts and litter are common on most sites.
- 2.2.32 **Semi-Desert Grasslands** Semi-desert grasslands are dominated by native perennial bunchgrasses (including Indian ricegrass, galleta, and needle and thread). Invasive plant species and/or undesirable native plant species that are currently abundant on most sites are absent or rare. Biological soil crusts and litter are common on most sites.
- 2.2.33 **Mountain Grasslands -** Mountain grasslands display moderate to high canopy cover of desirable native grasses and forbs (including Arizona fescue at mid elevations and Thurber fescue at higher elevations). Invasive plant species and undesirable native plant species that are currently abundant on many sites are absent or rare. Litter is common and well distributed.
- 2.2.34 **Alpine -** Alpine terrestrial ecosystems sustain their ecosystem diversity. They display a diverse composition of desirable native plant species and vegetation communities (including fellfield and turf types). Invasive plant species are absent or rare.
- 2.2.35 Soil productivity is maintained at site potential or is trending towards site potential.
- 2.2.36 Long-term levels of soil organic matter and soil nutrients (including soil carbon) are maintained at sustainable levels.
- 2.2.37 Ground cover (vegetation and litter) is adequate to protect soils and prevent erosion.
- 2.2.38 Management-induced soil erosion, soil compaction, soil displacement, puddling, and/or severely burned soils are rare on terrestrial ecosystems of the SJNF.
- 2.2.39 Upland soils exhibit infiltration and permeability rates that minimize surface runoff and allow for the accumulation of the soil moisture necessary for plant growth and ecosystem function.
- 2.2.40 Biological soil crusts are maintained or increased in pinyon-juniper woodlands, sagebrush shrublands, semi-desert shrublands, and semi-desert grasslands.
- 2.2.41 Fens, wetlands, and hanging gardens have the water sources and hydrologic systems necessary to support and sustain the special status plant species associated with them.
- 2.2.42 Shale and gypsum soils have the characteristics necessary to support and sustain the special status plant species associated with them.
- 2.2.43 Soils that provide habitat for all special status plant species maintain the soil conditions necessary to support and sustain those species.
- 2.2.44 Areas that are identified as critical habitat or proposed critical habitat for federally listed plant species have the characteristics necessary to provide for the growth and reproduction of the federally listed plant species for which they were designated.

#### **Objectives**

2.2.58 Over the life of the LRMP, collect seed from 20 local vulnerable grass, forb, and shrub species, including some alpine species, for long-term storage to protect genetic sources (10 species on the SJNF and 10 species on TRFO lands).

#### **Standards**

- 2.2.66 Projects or activities in habitat occupied by federally listed plant species, or in designated critical habitat, must be designed and conducted in a manner that preserves the primary constituent elements needed to sustain the life history processes of those federally listed plant species.
- 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.
- 2.2.68 Projects or activities that occur in shale and gypsum soils that are occupied by special status plant species must be designed to maintain the soil characteristics necessary to support and sustain those species.

#### Guidelines

- 2.2.69 Agency actions should not adversely affect the long-term soil productivity or carbon storage of terrestrial ecosystems.
- 2.2.71 Projects or activities occurring in suitable habitat for federally listed plant species should be managed to minimize long-term impacts to the suitable habitat.
- 2.2.75 Ground-disturbing projects on shale soils of the Mancos Shale, Lewis, Fruitland, and Morrison geologic formations, and other highly erosive soils, should be designed to include efforts that avoid or mitigate soil erosion or compaction (see Volume III, Appendix I).
- 2.2.77 Adequate slash (including tree tops and limbs), if deemed necessary for soil protection or nutrient cycling, should be left on-site following timber harvest and mechanical fuels treatments, and distributed as needed.
- 2.2.80 Ground disturbance should be limited or otherwise mitigated on gypsum soils and organic soils (histosols) in order to protect the ecological integrity of these rare and unique soils and the rare plants associated with these soils.
- 2.2.84 Certified, weed-free native seed mixes of local ecotypes should be used to revegetate terrestrial ecosystems where commercially available. Non-native, non-invasive plant material may be used in limited situations where considered necessary in order to protect resources and/or stabilize soils in a timely fashion. Persistent non-natives or invasive exotic plant species should be avoided.

# **LRMP 2.3 Terrestrial Wildlife**

#### **Desired Conditions**

- 2.3.1 Wildlife populations are viable on SJNF lands. Wildlife populations are self-sustaining, connected, and genetically diverse across SJNF and TRFO lands.
- 2.3.2 Big game severe winter range, winter concentration areas, and production areas are capable of supporting populations that meet state population objectives. These areas provide sustainable forage and habitat in areas with acceptable levels of human disturbance which do not reduce habitat effectiveness.

- 2.3.3 Invasive exotic wildlife species and diseases do not become established within the planning area. Existing invasive exotic wildlife species and diseases do not spread.
- 2.3.4 Habitat components (e.g., snags and downed logs) are maintained. Unique habitat types (e.g., springs, seeps, willow carrs, caves, and cliffs) support associated flora and fauna (with abundance and distribution commensurate with the capability of the land).
- 2.3.5 Large predator species contribute to ecological diversity and ecosystem functioning.
- 2.3.6 Projects and activities occurring on USFS and BLM lands near state and federal highways are designed to provide for long-term connectivity and integrity of habitats to facilitate effective wildlife movement.
- 2.3.7 Snag and downed wood features occur in quantities that support self-sustaining populations of associated species.
- 2.3.8 Effective raptor nesting habitat occurs throughout the planning area with abundance and distribution commensurate with the capability of the land to sustain populations.
- 2.3.9 Ecosystems and habitat conditions for terrestrial wildlife species sensitive to human disturbance are maintained.
- 2.3.11 Habitat continuity and travel corridors exist and persist to facilitate species movement and establishment into newly suitable areas as a result of changing habitats.
- 2.3.12 Populations are conserved by maintaining or improving habitat availability and quality through the incorporation of conservation strategies and species' habitat needs during project development and implementation.
- 2.3.13 Riparian and aquatic habitat, including springs and fens, support well-distributed populations of invertebrate and vertebrate riparian and aquatic dependent wildlife special status species.
- 2.3.14 Disturbances from management activities occur at levels that support critical life functions and sustain key habitat characteristics for wildlife special status species.
- 2.3.15 Areas identified as critical habitat or proposed critical habitat for special status wildlife species have the characteristics to support sustainable populations, promoting recovery of the species.
- 2.3.16 The alpine and subalpine willow (Salix sp.) dominated riparian areas, providing crucial winter habitat for white-tailed ptarmigan (Lagopus leucura) and snowshoe hare (Lepus americanus), do not bioaccumulate heavy metals above historically occurring background levels which enter the food chain. Areas of contamination do not become limiting factors for wildlife population sustainability.
- 2.3.17 Management actions maintain or improve habitat conditions for special status species, contributing to the stability and/or recovery of these species.
- 2.3.18 Special status species are able to disperse within the planning area and into adjacent lands. This will allow for the interchange between populations and the maintenance of genetic diversity.
- 2.3.19 MIS are able to disperse freely across the planning area allowing for the interchange between populations and the maintenance of genetic diversity (SJNF only).

# **Objectives**

2.3.27 **Nokomis fritillary butterfly**: Over the life of the Plan, restore the hydrologic conditions and plant communities during project implementation at springs or seeps capable of supporting Nokomis fritillary while, at the same time, retaining the water development for livestock or other

uses.

- 2.3.28 **Bats**: Over the life of the LRMP, all mine closures for human safety at sites supporting bat populations include structures (such as bat gates) designed to provide for continued use as bat habitat.
- 2.3.30 **Invasives and disease**: Over the life of the plan, coordinate with CPW to prevent introductions or spread of fish or terrestrial wildlife species, as needed, where there is potential for negative impacts on Wildlife Special Status Species.

#### Standards

- 2.3.35 Standards for the Golden eagle, Bald eagle, and Peregrine falcon are listed in Table 2.3.2.
- 2.3.37 **Bats**: If abandoned mines are closed, surveys will be conducted to determine occupancy. If surveys cannot be completed, occupancy will be assumed and mine closures must allow for bat access. Abandon mines that are determined to be hazardous to bats will be closed to bats.
- 2.3.38 **Bats**: Human access at occupied caves or abandoned mines will be restricted as necessary during the following periods to maintain essential life cycle processes:
  - Maternity sites April 15 through September 1
  - Swarming sites August 15 through October 15 (30 minutes before sunset to 30 minutes after sunrise)
  - Winter hibernaculum October 15 through May 15
- 2.3.39 **Bighorn sheep** (*Ovis canadensis*): During project-level planning on domestic sheep (*O. aries*) allotments, management options must be developed to prevent physical contact between domestic sheep and bighorn sheep. Actions may include but are not limited to boundary modification, livestock-type conversion, or allotment closures.
- 2.3.40 **Bighorn sheep**: Grazing permit administration in occupied bighorn sheep habitat must utilize measures to prevent physical contact between domestic sheep and bighorn sheep. Permit administration actions may include but are not limited to use of guard dogs, grazing rotation adjustments, or relocation of salting and bed grounds.
- 2.3.41 **Bighorn sheep**: Management of recreational pack goats and other domestic goats (*Capra aegagrus hircus*) must utilize measures to prevent the risk for physical contact with bighorn sheep.
- 2.3.42 **Bighorn sheep**: Domestic goats used for invasive plant control must be veterinarian certified as free of pathogens transmissible to bighorn sheep, except in areas where there is no risk of contact with bighorn sheep.
- 2.3.43 **Butterflies**: Management actions that could adversely impact reproductive habitat for occupied BLM and FS special status butterfly species must be designed to sustain host plant species.
- 2.3.44 Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus): New noise sources resulting from management activities must not contribute to noise levels that negatively impact sharp-tailed grouse leks during the active lek season (March 1 to June 30) based on best available science
- 2.3.45 **Gunnison Sage-grouse**: Management activities must not occur from March 1 to June 30 within occupied habitat suitable for nesting to allow for breeding and December 1 to March 15 for known winter habitat.
- 2.3.46 **Gunnison Sage-grouse**: New structural improvements or surface disturbance must not occur within known winter concentration area or within a 0.6-mile radius of known Gunnison sage-

grouse leks.

- 2.3.47 Gunnison Sage-grouse: In occupied habitat fuels treatments must be designed and implemented with an emphasis on protecting and enhancing existing sagebrush ecosystems
- 2.3.48 **Gunnison Sage-grouse**: Invasive vegetation must be monitored and controlled post-treatment.

#### Guidelines

- 2.3.49 Guidelines for the Golden eagle, Bald eagle, Osprey, Peregrine falcon, Northern Goshawk, Burrowing Owl and all other accipiter, Buteo, Falcon, Harrier, and Owls are listed in Table 2.3.2.
- 2.3.50 In order to determine site occupation, pre-implementation surveys may be required for projects occurring in habitats that may support populations of Sensitive Species and Species listed or proposed under the Endangered Species Act, as determined by an agency biologist.
- 2.3.51 Bats: Human access should be managed at caves and abandoned mines where known bat populations exist to protect bat habitat from disturbance and/or the introduction of pathogens. Management examples include, but are not limited to: seasonal or permanent closures, and excluding humans by installing bat gates.
- 2.3.52 Bats: Where known bat concentrations of significant conservation concern are located outside of caves or abandoned mines (such as in bridges structures, rock crevasse, or tree snags), human disturbance should be managed in order to protect those populations and the concentration site's physical features.
- 2.3.53 Bats: On the SJNF, formal mineral withdrawal of abandoned mines for conservation for special status bat species should be pursued when demonstrated necessary to prevent loss of effective or crucial habitat due to mining activity.
- 2.3.54 **Bats**: At swarming sites, hibernacula, and maternity sites, activities that may alter the suitability of the cave or abandoned mine for bat occupation should not occur within 500 feet of the entrance, unless to rehabilitate the suitability of the site or install mine safety closures.
- 2.3.55 Migratory birds: Projects or activities should consider and undertake proactive bird conservation actions as practicable particularly during breeding season, to maintain or improve habitat needs over the long-term for species identified by each agency as priority for conservation action.
- 2.3.56 The drainage of acid-mine run-off through alpine and sub-alpine willow-dominated riparian areas that provide crucial winter habitat for white-tailed ptarmigan and snowshoe hare should be avoided in order to prevent physiological impacts from the effects of bioaccumulation of heavy metals.
- 2.3.57 **Pollinators**: Pollinators should be considered during the application of pesticides to prevent population level impacts and maintain pollinator function in the ecosystem.
- 2.3.58 New structural improvements, reconstruction and operations should be designed to provide for wildlife movement to sustain populations.
- 2.3.59 Projects or activities that adversely impact pronghorn (Antilocapra americana) and elk production areas should be limited or avoided. This will keep reproductive success from being negatively impacted from management activities by using access restrictions during the following periods:
  - Pronghorn: May 1-July 1 Elk: May 15-June 30

- 2.3.60 Management activities and access should be limited or avoided in critical winter range, severe winter range, and winter concentration areas for pronghorn, elk, and mule deer during the following times to keep survival and reproduction from being negatively impacted (see Figures 2.3.1, 2.3.2, and 2.3.5):
  - Pronghorn: Dec 1 April 30
  - Elk: Dec 1 April 30
  - Mule deer: Dec 1 April 30
- 2.3.61 Severe and critical big game winter range and winter concentration areas: In Animas City Mountain and Grandview Ridge, conditions-based winter wildlife closures should be implemented in order to protect critical and severe winter range and winter concentrations areas for elk and mule deer. This includes Animas and Grandview recreation areas. These closures may be implemented at any time between December 1 and April 30. The closures should be based on existing snow conditions and/or the level of wildlife use for the given area. The specific conditions that will trigger a closure or that will allow the BLM to open the Cortez or Durango Special Recreation Management Areas (SRMA) will be based on snow conditions of 16 inches. Parameters for re-opening will be based on 1) general assessment of the north facing slope, such as absence of snow; 2) weather/snow condition in the general surrounding area; 3) presence of big game at higher elevations; and 4) coordination with CPW.
- 2.3.62 **Ungulates**: Projects or activities in big game critical winter range, winter concentration areas, severe winter range, production areas and important migration corridors should be designed and conducted in a manner which preserves and does not reduce habitat effectiveness within those mapped areas.
- 2.3.63 **Ungulates**: In order to provide for healthy ungulate populations capable of meeting State population objectives, anthropomorphic activity and improvements across the planning area should be designed to maintain and continue to provide effective habitat components that support critical life functions. This includes components of size and quality on the landscape providing connectivity to seasonal habitats (wildlife travel corridors), production areas, critical winter range, severe winter range and winter concentration areas, along with other habitat components necessary to support herd viability.
- 2.3.64 **Bighorn sheep**: Projects or activities that adversely impact bighorn sheep production areas by reducing habitat effectiveness should be limited or avoided, using access restrictions during the following periods (see Figure 2.3.3 of the LRMP):
  - Rocky Mountain bighorn sheep (Ovis canadensis canadensis): April 15

    –June 30
  - Desert bighorn sheep (O.c. nelsoni): February 1-May 1
- **2.3.65 Bighorn** sheep: Projects or activities that adversely impact bighorn sheep severe winter range and winter concentration areas by reducing habitat effectiveness should be limited or avoided using access restrictions during the following periods:
  - Rocky Mountain bighorn sheep: November 1–April 15
  - Desert bighorn sheep: December 1–April 15
- 2.3.66 **Wildlife corridors**: Public ownership of important wildlife movement corridors should be maintained. Priority areas are those adjacent to public highways or where public lands are identified as a key component in maintaining the integrity of seasonal movements by wildlife in an otherwise restricted landscape.
- 2.3.67 **Columbian sharp-tailed grouse**: Surveys for new/unknown Columbian sharp-tailed grouse leks within occupied.
- 2.3.68 **Columbian sharp-tailed grouse**: Management activities that adversely impact critical life functions should not occur from March 15 to July 30 within a 1.25-mile radius of mapped occupied Columbian sharp-tailed grouse leks to allow for breeding and December 1 to March 15

- for known winter habitat to provide for effective winter habitat to support populations on the landscape.
- 2.3.69 **Columbian sharp-tailed grouse**: No new structural improvements or surface disturbance should occur within known winter habitat or within a 0.4-mile radius of known Columbian sharp-tailed grouse leks to maintain effective habitat for critical life functions.

#### **Gunnison Sage-grouse**

- 2.3.70 Structures in sage-grouse habitat should be constructed to limit risk of collision and predation.
- 2.3.71 New noise sources resulting from management activities should not contribute to noise levels that negatively impact sage-grouse leks during the active lek season (March 1 to June 30) based on best available science.
- 2.3.72 Projects in occupied GUSG habitat should be designed to mitigate or avoid the direct or indirect loss of habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important habitat necessary for sustainable local populations. Projects will incorporate special reclamation measures or design features that accelerate recovery and/or re-establishment of affected sage-grouse habitat as much as possible.
- 2.3.73 Applicable BMPs should be applied to all mineral proposals as Conditions of Approval within occupied sage-grouse habitat to provide for adequate effective habitat and breeding, nesting, and wintering habitat.
- 2.3.74 Remote methodologies for monitoring, transporting fluids to centralized collection tanks, etc., should be utilized to minimize human disturbance in GUSG habitat.
- 2.3.75 Fuels treatments should be designed to meet strategic protection of identified occupied sagegrouse habitat.
- 2.376 Use of native seeds should be used for revegetation following fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives
- 2.3.77 Within occupied Gunnison sage-grouse critical habitat the RCP grazing guidelines should be incorporated when appropriate.
- 2.3.78 Within occupied habitat, grazing in treatment areas should be deferred for 2 growing season after treatment, unless needed for seedbed preparation or desired understory and overstory are established.
- 2.3.79 When developing or modifying water developments, BMPs (see Appendix N) should be used to mitigate potential impacts from West Nile virus on sage-grouse within occupied habitat.

Table 2.3.2: Raptor Timing and Buffer Zone Distance Standards and Guidelines

Species	Impact/Risk	Time Frame	Buffer Distance****	Source
Golden eagle	Structural	Year-round	Year-round New structures must not occur within a 0.5-mile	
	improvements*			
	Disturbance **	December	mber Human encroachment should not occur within	
		15–July 15	15–July 15 0.5 mile of an active nest during the nesting	
			season. (G) ***	
Bald eagle	Structural	Year round	New structures must not occur within a 0.5-mile	SJNF and
	improvements*		radius of an active nest. (S)***	TRFO

Species	Impact/Risk	Time Frame	Buffer Distance****	Source
	Disturbance**	November	Human encroachment should not occur within	SJNF and
		15–July 15	0.5 mile of an active nest during the nesting	TRFO
			season. (G)***	
Bald eagle	Structural	Year round	New structures must not occur within 0.5 mile	SJNF and
winter roost	improvements*		of a communal roost site. (S)	TRFO
	Disturbance**	November 15   Human encroachment should not occur within a		CPW 2008
		–March 15	0.25-mile radius (indirect line of sight) or a 0.5-	
			mile radius (direct line of sight) of a communal	
			winter roost site (as identified by CPW and the	
			managing agency biologist). (G)	
			Limit activity between 10 a.m. and 2 p.m. if	
			encroachment will occur within buffer zones.	
	**		(G)	anie i
Osprey	Disturbance**	April 1–	Human encroachment should not occur within	SJNF and
		August 31	0.25 mile of a nest during the nesting season.	TRFO
	C+ + 1	37 1	(G)	CPW 2008
	Structural	Year-round		
Danagning Calagn	Improvements* Structural	Year-round	mile radius of an active nest. (G)  New structures must not occur within a 0.5-mile	CPW 2008
Peregrine falcon	Improvements*	Y ear-round	radius of an active cliff nest complex. (S)	
	Disturbance**	March 15–		
	Disturbance	July 31	0.5 mile of a nest during the nesting season. (G)	CPW 2008
Northern	Disturbance**	March 1–	Human encroachment should not occur within	SJNF and
goshawk	Bistarounce	August 31	0.5 mile of a nest during the nesting season. (G)	TRFO
Besim	Structural	Year-round	New structures should not occur within a 0.5-	CPW 2008
	Improvements*	1001100110	mile radius of an active nest. (G)	21 11 2000
Burrowing owl	Disturbance**	March 15-	Human encroachment should not occur within	Romin and
		August 15	0.25 mile of nest burrows when owls may be	Muck 2002
			present during the nesting season. (G)	
	Structural	Year-round	New structures should not occur within a 0.25-	Romin and
	Improvements*		mile radius of active nests or within occupied	Muck 2002
			habitat. (G)	
All other raptors	Disturbance**	Varies by	Determination of the application of these	Romin and
		species	specific seasonal restrictions, timing limitations,	Muck 2002
			and/or buffer distances should be made by the	
			project biologist, guided by agency	
			requirements, along with professional	
			knowledge and experience. They will be	
			considered on a case-by-case basis, taking into	
			consideration site-specific factors such as	
			topography, vegetation, species of raptor,	
			historic patterns of human activity and	
			infrastructure, and observed behaviors of	
			individual birds. (G)	

Species	Impact/Risk	Time Frame	Buffer Distance****	Source
	Structural	Varies by	Determination of the application of these	Romin and
	Improvements*	species	specific seasonal restrictions, timing limitations,	Muck 2002
		-	and/or buffer distances should be made by the	
			project biologist, guided by agency	
			requirements, along with professional	
			knowledge and experience. They will be	
			considered on a case-by-case basis, taking into	
			consideration site-specific factors such as	
			topography, vegetation, species of raptor,	
			historic patterns of human activity and	
			infrastructure, and observed behaviors of	
			individual birds. (G)	

<sup>\*</sup>Structures include improvements such as roads, trails, radio towers, power lines, aboveground transmission corridors, and wells as proposed following nest establishment. This is not intended to include structures that historically occurred in the area prior to nest establishment.

Note: (S) = Standard; (G) = Guideline.

Table information is based on a variety of sources, including 2008 Colorado Parks and Wildlife raptor guidelines, Romin and Muck (2002), professional knowledge of local area conditions, Reynolds et al.'s (1992) recommendations specific to the SJNF, and Bald and Golden Eagle Protection Act conformance

Where literature and other evidence shows, exceptions may occur when individuals are adapted to human activity. Management is designed to reduce impacts during sensitive periods.

# **LRMP 2.4 Riparian Area and Wetland Ecosystems**

#### **Desired Conditions**

- 2.4.1 Riparian area and wetland ecosystems have a diverse composition of desirable native hydrophytic plants that are vigorous and self-perpetuating. Invasive plant species are absent or rare.
- 2.4.2 Riparian area and wetland ecosystems have vegetation cover sufficient to catch sediment, dissipate energy, prevent erosion, stabilize stream banks, enhance aquatic and terrestrial wildlife habitat, and promote floodplain development.
- 2.4.3 Forest and shrubland types display hydrophytic trees and shrubs in a variety of size classes; they provide terrestrial and aquatic habitats, stream shading, woody channel debris, aesthetic values, and other ecosystem functions.
- 2.4.4 Woody debris in a variety of sizes is present in forest and shrubland riparian area and wetland ecosystem types.
- 2.4.5 Riparian area and wetland ecosystems are resilient to change from disturbances (including from floods, fire, and drought) and offer resistance and resilience to changes in climate.
- 2.4.6 Riparian area and wetland ecosystems have flow regimes and flooding processes that contribute to stream-channel and floodplain development, maintenance, and function, and facilitate the regeneration of native hydrophytic plants (including narrowleaf cottonwood [Populus angustifolia] and Rio Grande cottonwood [P. deltoides ssp. wislizeni]) that depend on flooding for regeneration.

<sup>\*\*</sup>This does not apply to historic levels and patterns of disturbance under which the nest was established and is intended to apply to additional levels and change in disturbance patterns.

<sup>\*\*\*</sup>Golden and bald eagle nest as defined under the Bald and Golden Eagle Protection Act.

<sup>\*\*\*\*\*</sup>Buffer distances for some species may vary based on site-specific information, current science, and agency wildlife biologists' professional judgment. Area closures may be considered where appropriate.

- 2.4.7 The composition, structure, and function of fens and hanging gardens are intact (including their native plant species, organic soils, and hydrology).
- 2.4.8 Riparian area and wetland ecosystems that contain plant communities with G1, G2, S1, or S2 NatureServe Plant Community conservation status ranks are protected, have habitat to expand into, and have the water quantity and hydrologic systems necessary in order to support and sustain these communities.
- 2.4.9 Soil productivity is intact on all riparian area and wetland ecosystems on the SJNF and TRFO.
- 2.4.10 Long-term levels of soil organic matter and soil nutrients are maintained at acceptable levels on all riparian area and wetland ecosystems of the SJNF and TRFO.
- 2.4.11 Ground cover (vegetation and litter) is adequate to protect soils and prevent erosion on all riparian area and wetland ecosystems of the SJNF and TRFO.
- 2.4.12 Long term impacts to soils (e.g., soil erosion, soil compaction, soil displacement, puddling, and/or severely burned soils) from management actions are rare on all riparian area and wetland ecosystems of the SJNF and TRFO.

#### **Objectives**

- 2.4.13 Within 10 years, restore the ecological integrity of four deciduous riparian shrubland sites (two on SJNF and two on TRFO lands) that currently classify as riparian herbaceous lands by increasing the canopy cover of native hydrophytic shrubs by at least 10%.
- 2.4.14 Within 10 years, determine the functional condition of 40 miles (25 miles on TRFO and 15 miles on SJNF lands) of riparian area and wetland ecosystems using the Proper Functioning Condition assessment method (Prichard 1998).
- 2.4.15 Within 15 years, treat three fens on TRFO lands and two fens on SJNF lands with impaired functions.
- 2.4.16 Within 5 years, eradicate tamarisk and Russian olive (Elaeagnus angustifolia) on two stream reaches or two seeps/springs on TRFO lands, and if needed conduct follow-up treatment to prevent the establishment or spread of other invasive species.
- 2.4.17 Maintain native riparian and upland ecosystems that have been treated to control non-native species on a minimum of 50 miles of TRFO stream reaches over the next 20 years.
- 2.4.18 Maintain or restore native riparian ecosystems and connected uplands that have been treated to control non-native species on a minimum of 50 miles on the Dolores River and its tributaries on TRFO lands over the next 20 years.

#### **Standards**

- 2.4.19 Long term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.
- 2.4.20 Agency actions in protected areas must not adversely affect the long-term ecological integrity of the riparian area and wetland ecosystems within them.
- 2.4.21 Management actions must not cause long-term change away from desired conditions in riparian or wetland vegetation communities.

#### Guidelines

- 2.4.22 Agency actions should avoid or otherwise mitigate long-term adverse impacts to riparian areas and wetlands.
- 2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2 NatureServe Plant Community conservation status ranks, including wild privet (Forestiera pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis) woodlands, in order to maintain the ecological integrity of those rare plant communities.
- 2.4.24 Agency actions should avoid or otherwise mitigate damage to the long-term soil productivity of riparian area and wetland ecosystems.
- 2.4.25 Livestock browsing should not remove more than 25% of the annual leader growth of hydrophytic shrubs and trees.
- 2.4.26 Agency actions should avoid or otherwise mitigate adverse impacts to the abundance and distribution of willows to maintain or improve the ecological integrity of riparian area and wetland ecosystems.
- 2.4.27 Certified, weed-free native seed mixes of local ecotypes should be used to revegetate riparian area and wetland ecosystems where commercially available. Non-native, non-invasive plant material may be used in limited situations where considered necessary in order to protect resources and/or stabilize soils in a timely fashion. Persistent non-natives or invasive exotic plant species should be avoided.
- 2.4.28 Woody riparian vegetation along low-gradient ephemeral and permanent stream channels should be maintained or restored to ensure terrestrial food sources for invertebrates, fish, birds, and mammals, and to minimize water temperature changes.

# **LRMP 2.5 Aquatic Ecosystems and Fisheries**

#### **Desired Conditions**

- 2.5.1 Long-term sustainability of aquatic ecosystems is maintained.
- 2.5.2 Streams, lakes, riparian vegetation, and adjacent uplands provide habitats adequate to maintain healthy aquatic ecosystems capable of supporting a variety of native and desired non-native aquatic communities.
- 2.5.3 The quantity and quality of aquatic habitats are maintained or enhanced to provide for the long-term sustainability of biological diversity and population viability of all native and/or desired non-native vertebrate species.
- 2.5.4 Channel characteristics, water quality, flow regimens, and physical habitat features are diverse and appropriately reflect the climate, geology, and natural biota of the area.
- 2.5.5 An adequate range of stream flow provides for the long-term maintenance of physical habitat features. Channel features, including bank stability, width-to-depth ratio, pool/riffle ratio, pool depth, slope, sinuosity, cover, and substrate composition, are commensurate with those expected to occur under natural ranges of stream flow.
- 2.5.6 Water flow conditions in streams, lakes, springs, seeps, wetlands, fens, and aquifers support functioning habitats for a variety of aquatic and semi-aquatic species and communities.
- 2.5.7 Macroinvertebrate diversity and abundance reflect high water quality.

- 2.5.8 Populations of aquatic species are adequately mobile, genetically diverse, and functionally diverse throughout the planning area.
- 2.5.9 Aquatic systems are connected in a manner that avoids fragmentation of aquatic habitats and isolation of aquatic species. Connectivity between water bodies provides for all life history functions of aquatic species except where barriers are beneficial and necessary to achieve conservation goals for certain aquatic species.
- 2.5.10 All native and desired non-native fish species are disease free and thrive in the vast majority of systems historically capable of supporting such species.
- 2.5.11 Abundant Colorado River cutthroat trout populations are maintained and other areas are managed for increased abundance.
- 2.5.12 Threats to Colorado River cutthroat trout and its habitat are eliminated or reduced to the greatest extent possible.
- 2.5.13 The distribution of Colorado River cutthroat trout is increased where ecologically, sociologically, and economically feasible.

#### **Objectives**

- 2.5.14 Annually evaluate seven streams (five streams on NFS lands and two on BLM lands) for adequacy of instream flows sufficient to maintain population viability and otherwise achieve LRMP direction.
- 2.5.15 Annually enhance or restore at least 4 miles of stream habitat (3 miles on NFS lands and 1 mile on BLM lands) to maintain or restore the structure, composition, and function of physical habitat for USFS and BLM sensitive species or USFS MIS species.
- 2.5.16 Over the life of the LRMP, connect at least 10 miles of fragmented stream habitat (8 miles on NFS lands and 2 miles on BLM lands) to provide for aquatic species movement.
- 2.5.17 Over the life of the LRMP, establish two self-sustaining meta-populations on NFS lands, each consisting of five separate but interconnected sub-populations. In addition, establish one new population in each Geographic Management Unit within the historic range (Colorado River Cutthroat Trout Task Force 2001).

#### **Standards**

2.5.18 Where native or desired non-native fish species occur, or should occur, a minimum level of aquatic habitat shall be maintained by identifying the minimum flow rates required to support that habitat using at least one of the following four options (2.5.19a–2.5.19d):

- 2.5.18a. From April 1 through September 30, an instantaneous minimum flow equal to 40% of the average annual flow; from October 1 through March 31, an instantaneous minimum flow equal to 20% of the average annual flow (Tennant 1972).
- 2.5.18b. Stream flow in riffle habitats shall be maintained at levels that maintain the minimum values for mean water depth, wetted perimeter, and mean velocity, as defined in Table 2.5.3, for each stream size category (e.g., bankfull width).
- 2.5.18c. Stream flow in each reach shall be sufficient to maintain a minimum of 50% of the weighted usable area, for each life stage of each target species (USFWS 1984). The weighted usable area baseline (100%) will be the amount of habitat that would occur under natural, unaltered flow conditions.
- 2.5.18d. Stream flow in each reach shall be maintained at levels that have been determined using alternate methods and where it can be clearly demonstrated, to the satisfaction of the USFS and/or BLM, that said flows will be adequate to achieve the LRMP's goals and objectives for population viability and sustainable aquatic ecosystems.

Table 2.5.3: Metrics Applicable to Standard 2.5.18b

Bankfull Width (feet)	Mean Depth (feet)	Wetted Perimeter (%)	Mean Velocity (feet/second)
1–2	≥ 0.2	50	1.0
21–40	0.2-0.4	50	1.0
41–60	0.4–0.6	50–60	1.0
> 60	> 0.6	> 60	1.0

- 2.5.19 Prior to use in other waters, all agency, partnering agency, and contractor field equipment having had contact with whirling disease waters must be decontaminated using current decontamination procedures.
- 2.5.20 To prevent the spread of chitrid disease, established decontamination protocols must be used when working in waters and water influence zones for current and historic breeding sites for all sensitive and listed aquatic and amphibious species.

#### Guidelines

- 2.5.21 Agency actions should maintain or improve all existing habitat for designated conservation populations of Colorado River cutthroat trout (Colorado River Cutthroat Trout Task Force 2001).
- 2.5.22 Minimum pool levels should be established for water storage facilities where aquatic USFS MIS and/or BLM or USFS sensitive species occur.
- 2.5.23 Except where barriers are beneficial and necessary to achieve conservation goals for certain aquatic species, fragmentation of aquatic habitats and isolation of aquatic species should be avoided.
- 2.5.24 Sediment delivery to streams occupied by MIS or threatened, endangered, or sensitive species should be avoided.
- 2.5.25 Activities that may cause sedimentation to amphibian habitats should be minimized.
- 2.5.26 Drainage of acid-mine runoff into riparian areas and wetland amphibian habitats should be avoided.
- 2.5.27 Agency actions should avoid or mitigate impacts within 100 feet of boreal toad (Bufo boreas boreas) breeding sites between May 15 and September 30 (breeding season).

2.5.28 Agency actions should maintain or improve hydrologic function and water quality of known and historic breeding sites for all sensitive and listed aquatic and amphibious species to provide for effective habitat.

#### **LRMP 2.6 Water Resources**

#### **Desired Conditions**

#### Water Quality

- 2.6.1 State water quality standards and anti-degradation rules are met and state-classified water uses are supported for all water bodies.
- 2.6.2 Water quality for impaired water bodies on the State of Colorado's 303(d) list move toward fully supporting state-classified uses.
- 2.6.3 State "Outstanding Waters" within the planning area maintain the high levels of water quality necessary for this status.
- 2.6.4 Watersheds within the planning area containing saline soils exhibit stable upland, riparian, and channel conditions that produce water quality as close as possible to reference conditions (as defined in FSH 2509.25 for the USFS); they produce the lowest possible saline contributions to the upper Colorado River (per the Colorado River Basin Salinity Control Act for the BLM) (see Volume III, Appendix I for saline watersheds).
- 2.6.5 Water from SJNF and TRFO lands will meet applicable drinking water standards when given adequate and appropriate treatment. Management activities throughout the planning area protect and/or enhance the water quality of municipal supply watersheds (as defined in FSM 2542 for the USFS). Enhancement may be achieved by watershed restoration or other activities.

#### Stream Channels and Floodplains

- 2.6.6 Stream channel types that naturally build floodplains are connected to their floodplains and riparian areas, maintain the ability to transport overbank flows (which occur on the average every 1.5 years), and are capable of transporting moderate or high flow events.
- 2.6.7 Physical channel characteristics are in dynamic equilibrium and commensurate with the natural ranges of discharge and sediment load provided to a stream. Streams have the most probable form and the expected native riparian vegetation composition within the valley landforms that they occupy; they function correctly without management intervention.
- 2.6.8 Historically disturbed and degraded stream channels recover through floodplain development; establishment of riparian vegetation with correct structure, composition, and function; and stable channel geomorphic characteristics.

#### **Groundwater Resources**

- 2.6.9 Aquifers maintain natural conditions of recharge and discharge, especially where they are important to surface features dependent on groundwater for their existence (including caves, karst, springs, seeps, lakes, riparian areas, hanging gardens, wetland ecosystems, fens, and intermittent and perennial streams).
- 2.6.10 Potentially usable aquifers and water-bearing intervals possessing groundwater of quality and/or quantity that could provide multiple-use benefits and maintain water quality at natural conditions.
- 2.6.11 Administrative and permitted activities on the SJNF and TRFO do not contribute to the reduction of surface water or groundwater that supplies seasonal springs, seeps, small ponds, and small wetlands considered most vulnerable to a changing climate.

#### Watershed Conditions, Watershed Scale, and Water Uses

- 2.6.12 Upland areas function properly and do not contribute to stream-channel degradation.
- 2.6.13 The majority of undeveloped and unregulated or free-flowing streams within the planning area are retained in their current undeveloped condition; they provide potential reference conditions and offer unique opportunities for aquatic habitat, recreation, species conservation, and pleasing aesthetics.
- 2.6.14 The overall function and integrity of streams impacted by water developments are adequately protected for their baseline ecological and recreational values. This is accomplished by providing for adequate stream flows as part of water development planning for existing or new water development projects. This includes sustaining ecological processes dependent on flow within the impacted watersheds.
- 2.6.15 In unique cases where water is transferred from one catchment to another, water lost (i.e., there is no return flow) from watersheds as a result of water transfer does not adversely alter or impact the aquatic ecology of the watershed or the stream. Conversely, aquatic ecology and stability of the streams and watersheds receiving imported water are not adversely impacted.
- 2.6.16 All water developments for federal purposes have state water rights, if applicable. The beneficial use of water continues over the implementation life of the LRMP, when the water is available.
- 2.6.17 All approved water developments that involve the use of SJNF and TRFO lands are permitted pursuant to applicable federal authorizations.

## **Objectives**

#### Water Quality

- 2.6.18 Work with the selenium task force annually to reduce salt delivery to the upper Colorado River Basin.
- 2.6.19 Every 5 years rehabilitate 10 or more acres to reduce erosion and sedimentation delivery to water bodies on both TRFO and SJNF lands. For SJNF lands, conduct the work in priority watersheds, including those with water bodies listed for sediment impairment or that have total maximum daily loads (TMDLs) established for sediment.
- 2.6.20 Over the implementation life of the LRMP, actively participate in the development of all of the TMDL determinations and/or other appropriate options for the restoration of State of Colorado 303(d) listed impaired water bodies within the planning area (both TRFO and SJNF lands).
- 2.6.21 Over the life of the LRMP, implement BMPs to minimize management impacts to water quality on TRFO and SJNF lands. The effectiveness of BMPs will be improved if necessary through adaptive management.

#### Maintain or Improve Watershed Condition and Stream/Floodplain Function

- 2.6.22 Annually, treat approximately 20 acres or more in SJNF priority watersheds in order to improve poor watershed conditions or maintain good watershed conditions. The goal is to move a watershed from an impacted condition class to a better condition class or to maintain a good condition class.
- 2.6.23 Annually decommission 6 linear miles or more of unneeded routes that may consist of roads and/or trails on SJNF lands. Routes will be decommissioned on TRFO lands as identified through the travel management planning process. Watersheds listed in Volume III, Appendix I could be considered priority for decommissioning efforts. Watersheds designated as priority through the USFS Watershed Condition Framework should also be focus areas for route decommissioning.

#### Managing Water Uses

- 2.6.24 Annually acquire new appropriated water rights for 30 USFS water uses (including water rights for livestock, recreation, administrative, or other uses) within the planning area. For TRFO lands, pursue appropriated water rights for new or outstanding BLM water uses.
- 2.6.25 Over the implementation life of the LRMP, put all consumptive use water rights owned by the BLM and USFS to beneficial use and that use documented.
- 2.6.26 Based on review of monthly water court resumes, enter into any water court case necessary to protect BLM or USFS water rights and water-dependent resources.
- 2.6.27 Over the life of the LRMP, enforce compliance where the USFS or BLM place conditions and other requirements on special use authorizations related to water diversion or storage that are outside the jurisdiction of the Colorado Division of Water Resources.

#### Standards

- 2.6.29 Land use activities (new projects, or replacement/retrofitted/reconstructed/reauthorized projects) must not impact potentially useable groundwater quality or quantity to the extent that groundwater-dependent features are adversely affected. Examples of some groundwater-dependent features are springs, seeps, fens, and intermittent or perennial streams.
- 2.6.30 No activities must be allowed within aquatic management zones that will cause a long-term change from desired conditions. The protection or improvement of riparian values, water quality, aquatic community, and for long-term stream health in these areas must be emphasized. Aquatic management zones have a minimum horizontal width from the top of each bank of 100 feet or the mean height of the mature late-seral vegetation, whichever is greater.
- 2.6.31 In all places where technically feasible, pitless, self-contained drilling systems (e.g., closed loop drilling systems) must be used for all leasable fluid minerals wells.

#### Guidelines

- 2.6.32 Roads and trails that are removed from the SJNF transportation network, as well as maintenance level 1 roads (i.e., roads that have been closed to the public but may be used in the future principally for administrative purposes), should be treated sufficiently where no further management intervention would be necessary in order to sustain long-term natural processes. This will avoid future risks to watershed functions, water quality, and/or aquatic habitat. Sufficient treatments may include removal of unstable fills, effective and permanent breaching of drainage ditches, elimination of persistent in-sloped road surfaces; complete removal of stream-crossing structures and associated fills with restoration of floodplains, and the maintenance or restoration of fish passages.
- 2.6.33 Ditches authorized on the SJNF or TRFO should maintain a sufficient freeboard above the water line of the ditch to avoid or minimize damage to the ditch or from overtopping. Headgates and conveyance structures should be maintained in good functioning condition and should be clear of sediment and other debris in order to ensure proper operation. The operator should close the headgate at the end of the diversion (e.g., irrigation) season.

- 2.6.34 Water conveyance structures authorized on the SJNF or TRFO should be maintained to prevent and control soil erosion and gullying on adjacent lands resulting from operations and maintenance of the structure. Design criteria may include maintaining the ditch channel to prevent downcutting and ditch failure, removal of all obstructions from the channel, and prompt remediation of pipeline breaks and ditch failures, and rehabilitation of any erosion resulting from failure of a water conveyance structure.
  - 2.6.34a Water conveyance structures authorized on the SJNF or TRFO should allow for the passage of aquatic organisms if there is the potential to obstruct such passage to potential or occupied habitat.
  - 2.6.34b Headgates should contain measurement devices that can be used to determine compliance with land use authorization permits.
- 2.6.35 As a general practice non-toxic fluid, additives, and other materials should be used for well drilling to protect surface water and groundwater quality.
- 2.6.36 Exploration and production waste should be disposed of using BMPs that meet state regulations and specific BLM or USFS requirements. Exploration and production waste should be disposed of in such a manner as to not to inhibit reclamation success of the site.
- 2.6.37 Operators should use proven technologies for the recycling of fresh water, drilling fluids, and produced water for reuse in drilling and completion operations or other beneficial purposes whenever possible.
- 2.6.38 As individual fields are developed, centralized liquid gathering systems should be used for the delivery and gathering of drilling, completion, and produced fluids such as fresh water, waste/produced water, and condensate.
- 2.6.39 Water Use and Disposal Management Plans should be included in Plans of Development for fluid minerals projects and solid minerals projects.
- 2.6.40 Ground disturbance, facilities construction, and incompatible land management activities (those activities that may pose a risk of impacting water quality) on SJNF lands should be prohibited on lands within 1,000 horizontal feet of either side of a classified surface water supply stream segment (as measured from the average high water mark of a water body) for a distance of 5 miles upstream of public water supply intakes for towns, cities, and municipalities. These activities should also be prohibited within a minimum distance of 1,000 horizontal feet for source water protection areas for towns, cities, and municipalities using a groundwater well or spring.

# **LRMP 2.7 Livestock and Rangeland Management**

#### **Desired Conditions**

2.7.4 Rangelands provide healthy and sustainable habitat for wildlife populations that, in turn, support recreational hunting, fishing, and/or viewing (thereby contributing to the local and regional economy).

#### Standards

#### **Livestock Management**

- 2.7.11 Grazing permit administration in occupied bighorn sheep habitat must utilize measures to prevent physical contact between domestic sheep and bighorn sheep. Permit administration actions may include but are not limited to use of guard dogs, grazing rotation adjustments, or relocation of salting and bed grounds.
- 2.7.12 Management of domestic sheep must utilize measures to prevent physical contact with bighorn sheep.

#### Guidelines

#### **Livestock Management**

2.7.17 Prior to allocating grazing privileges for a new grazing permittee on unallocated grazing allotments, the needs of existing rangeland management, as well as ecological diversity and species viability, should be considered.

# **LRMP 2.8 Invasive Species**

#### **Desired Conditions**

- 2.8.1 Invasive species management is coordinated with adjacent land owners.
- 2.8.3 Invasive species, both terrestrial and aquatic, are absent or rare within the planning area, and are not influencing native populations or ecosystem function.
- 2.8.4 Invasive species are not introduced or spread within protected areas.
- 2.8.5 Management activities do not contribute to the spread of invasive annual plants or other invasive species.

#### **Objectives**

- 2.8.6 Within 15 years, contain priority Class B invasive species on TRFO and SJNF lands identified in the Invasive Species Action Plan.
- 2.8.7 Within 15 years, increase annual treated acres of noxious weeds to 10% of known acres infested on TRFO and SJNF lands.
- 2.8.8 Within 15 years, annual backcountry treatment (including wilderness areas and WSAs) is 10 to 15% of the total annual noxious weed treatment target on SJNF and TRFO lands.
- 2.8.9 Over the life of the LRMP eradicate newly established invasive species especially Colorado Class A noxious species on both SJNF and TRFO lands.

#### Standards

- 2.8.10 Projects or activities that would authorize the use of forage products must use certified "noxious weed seed-free" forage products.
- 2.8.11 Invasive species must be managed using integrated weed management principles.
- 2.8.12 The SJNF and TRFO must include provisions that are necessary to prevent the spread of and to control the introduction of invasive species in contracts and permits for use of SJNF and TRFO lands and resources.

#### Guidelines

- 2.8.13 Cleaning facilities and associated educational materials should be developed for boating areas in cooperation with CPW or other state and local regulatory agencies.
- 2.8.14 Wildland fire operations should follow direction provided in Interagency Standards for Fire and Fire Aviation Operations (NFES 2724; USFS et al. 2013) under the Operational Guidelines for Aquatic Invasive Species section to prevent the introduction and spread of aquatic invasive species.

- 2.8.15 Project planning and implementation should consider the need to prevent the introduction and spread of aquatic invasive species. The SJNF and TRFO Invasive Species Action Plan (USFS et al. 2012) provides a useful reference for appropriate management and mitigation measures.
- 2.8.16 High risk aquatic invasive species areas should be a priority for inventory and monitoring activities.
- 2.8.17 Proper equipment (e.g., vehicles, waders), cleaning techniques, and chemicals should be used as necessary to prevent the spread and establishment of aquatic invasive species.
- 2.8.18 For all proposed projects or activities, the risk of invasive aquatic and plant species introduction or spread should be determined and appropriate prevention and mitigation measures implemented.

#### **LRMP 2.9 Timber and other Forest Products**

#### Guidelines

- 2.9.18 Regeneration harvests of even-aged timber stands (sites) on SJNF lands should not be undertaken until the stands have generally reached or surpassed 95% of the culmination of the mean annual increment measured in cubic feet. Exceptions may be made where resource management objectives or special resource considerations require earlier harvest, such as:
  - stands in imminent danger from insect or disease attack;
  - wildlife habitat improvement;
  - scenery resource enhancement or rehabilitation;
  - ecosystem restoration; and
  - areas managed for Christmas tree production.

# **LRMP 2.10 Insects and Diseases**

#### **Desired Conditions**

- 2.10.1 Terrestrial Ecosystems have age- or size-class diversity, and compositional diversity that make them resistant to insect and disease outbreaks.
- 2.10.2 Insect and disease processes and cycles are similar to those that occurred during the reference period (HRV conditions) in MA 1.
- 2.10.3 Epidemic outbreaks are rare within management areas where active management is allowed.
- 2.10.4 Mortality of aspen trees in high value aspen forests due to sudden aspen decline is significantly reduced.

# **Objectives**

- 2.10.5 Within 5 years, use coppice timber treatments or prescribed fire to regenerate 500-1000 acres of low-elevation aspen forests that are experiencing sudden aspen decline on SJNF lands.
- 2.10.6 Within the next 10 years, reduce the risk of mortality due to bark beetles by increasing the mature-open development stage of ponderosa pine forests by 20,000 to 40,000 acres by using timber harvest and prescribed fire in the mature-closed development stage of ponderosa pine forests on SJNF lands.
- 2.10.7 Within 10 years, continue with treatment of developed recreation facilities, ski areas, and administrative sites to reduce susceptibility and hazards from insect and disease incidence, and increase long-term forest health, vigor, and resiliency on SJNF and TRFO lands.

#### Standards & Guidelines

There are no Standards or guidelines for insects and disease.

# **LRMP 2.11 Fire and Fuels Management**

#### **Desired Conditions**

- 2.11.6 Major veg types reflect little or no departure from historic range of variation of fire frequency and intensity (e.g., reflect fire regime condition class 1).
- 2.11.7 Planned and unplanned fire ignitions are used to increase resiliency and diversity across all forest and rangeland vegetation types.
- 2.11.8 Fire is reintroduced to increase the resistance and resiliency of the warm-dry mixed conifer and ponderosa pine forest types in landscape such as the Hermosa and Piedra areas.
- 2.11.9 The occurrence of low elevation fires burning upward into spruce fir forest will increase over time to promote the heterogeneity of spruce-fir forests.

#### Standards

- 2.11.13 Natural Fire ignitions will be used, when feasible, to reintroduce fire into fire-adapted and dependent ecosystems. Fire for ecological benefit will be used as a resource management tool where and when allowed.
- 2.11.14 Restoration and recovery in areas, when possible, must be provided where critical resource concerns merit rehabilitation for controlling the spread of invasive species, protecting areas of cultural concern, or protecting critical or endangered species habitat.

#### Guidelines

- 2.11.16 Seeding and other site-rehabilitation practices should be provided, as necessary, on wildland fire and managed wildland fire areas. Fire suppression support activities and facilities (including constructed firelines, fuel breaks and safety areas, fire camps, staging areas, heli-bases, and heli-spots); and mechanical and prescribed fire treatment areas should follow the same site-rehabilitation practices.
- 2.11.17 Aerial application of retardant in live water, wetlands and riparian areas should be avoided unless necessitated by human safety or property loss considerations.

# **LRMP 2.12 Air Quality**

# Objectives

2.12.8 For the Weminuche Wilderness Class 1 Area, improve air quality so that flora and fauna AQRVs that are at risk (including lichens, amphibians, and aquatic organisms) recover to a level that is within the limits of acceptable change (compared to natural conditions) by the next planning period so that there is no humanly perceptible change in visibility (visual range, contrast, coloration) from that which would have existed under natural conditions (conditions substantially unaltered by humans or human activities).

# **LRMP 2.13 Access And Travel Management**

2.13.28 Road Density Guideline for Water Quality and Watershed Health on TRFO Lands: In order to protect water quality, watershed function, major surface source water protection areas for municipalities, and to ensure compliance with the Colorado River Basin Salinity Control Act, use

the best available information for determining the appropriate level of road density when analyzing and approving management actions that affect motorized routes.

- 2.13.29 Road and Motorized Trail Density Guideline for Ungulate Production Areas, Winter Concentration Areas, Severe Winter Range, and Critical Winter Range on SJNF Lands: The intent of this guideline is to ensure no net loss of existing habitat effectiveness within the areas listed below. In order to maintain wildlife habitat effectiveness of SJNF lands, road and motorized trail densities should be addressed when analyzing and approving management actions that affect motorized routes. Where management actions would result in road and motorized trail densities exceeding 1 mile/square mile on SJNF lands in the areas listed below, actions should be designed to maintain habitat effectiveness on SJNF lands throughout each mapped polygon. Habitat effectiveness for this guideline is considered maintained when road densities within the CPW mapped areas on SJNF lands listed below are less than or equal to 1 mile/square mile. When road densities exceed 1 mile/square mile within the CPW mapped areas on SJNF lands listed below, densities should not be increased without mitigation designed to maintain habitat effectiveness.
  - Big game production areas (calving or lambing areas)
  - Elk and deer severe winter range
  - Elk and deer winter concentration areas
  - Deer critical winter range

The following parameters and constraints will be used to calculate road and motorized trail density for wildlife:

- 2.13.29a Roads used to develop route density calculations include roads on NFS lands only, regardless of road ownership, that are a) open year-long or seasonally to public use and b) closed to public use, but are used for administrative access or are authorized by contract, permit, or other written authorization. Included in these calculations are maintenance level 2–5 NFS roads. Also included for this calculation are NFS trails that are designated for motorized use. Roads and motorized trails with design features sufficient to maintain habitat effectiveness (such as seasonal closures that are determined to be sufficient mitigation), as determined by the USFS biologist, should not be used for final density calculations. Non-motorized trails and those roads that are closed to all motorized use and/or are in storage are not used for route density calculations. Temporary roads to be used for 5 years or less are not included in these calculations.
- 2.13.29b Data used for density calculations will be based on the best available information at the time of analysis.
- 2.13.31 Road and Motorized Trail Density Guideline for Deer and Elk General Winter Range on SJNF Lands: Where management actions would result in road and motorized trail densities exceeding 1 mile/square mile and where CPW analysis determines that road and motorized trail densities inhibit the state's ability to meet population objectives, SJNF management actions should be designed to reduce the impacts of road density on habitat effectiveness throughout each mapped general winter range polygon. This guideline applies to the portions of each mapped general winter range polygon not covered under Guideline 2.13.29.

The following parameters and constraints will be used to calculate road and motorized trail density for wildlife:

2.13.31a Roads used to develop route density calculations include roads on NFS lands only, regardless of road ownership, that are a) open year-long or seasonally to public use and b) closed to public use, but are used for administrative access or are authorized by contract, permit, or other written authorization. Included in these calculations are maintenance level 2–5 NFS roads. Also included for this calculation are NFS trails that are designated for motorized use. Roads and motorized trails with design features sufficient to maintain habitat effectiveness (such as seasonal closures that

are determined to be sufficient mitigation), as determined by the USFS biologist, should not be used for final density calculations. Non-motorized trails and those roads that are closed to all motorized use and/or are in storage are not used for route density calculations. Temporary roads to be used for 5 years or less are not included in these calculations.

2.13.31b Data used for density calculations will be based on the best available information at the time of analysis.

#### **LRMP 2.14 Recreation**

#### **Desired Conditions**

#### **Developed Recreation**

#### Winter Recreation:

2.14.36 Timing restrictions for motorized over-snow recreational use may be employed in wildlife habitat areas or due to ground conditions.

# **LRMP 2.18 Lands and Special Uses**

#### **Desired Conditions**

2.18.3 The SJNF and TRFO retains and/or acquires river frontage, riparian areas and wetland ecosystems, and other lands that would enhance or protect recreation, open space, scenery, clean air and water, and key habitat for species.

# **Objectives**

2.18.12 Annually, ensure that all relevant desired conditions are being met or trending toward being met in special use permit areas by inspecting at least 5% of existing special use permit areas.

#### Guidelines

2.18.16 The SJNF and TRFO should acquire or retain lands, interest in lands, or ROWs or easements:

- within designated wilderness areas, other Congressionally classified areas, such as the Piedra Area and wild and scenic rivers (WSR), and WSAs;
- that provide habitat for animal and plant species designated as threatened or endangered, and/or for other species identified for special protection;
- that contain wetlands and/or floodplains and associated riparian ecosystems, or enhance watershed protection;
- with historical or important heritage resources;
- where resource management or values are threatened by change of use or may be enhanced by public ownership;
- that enhance resource management and values, improve production of goods and services, or are needed to meet resource management goals and objectives;
- that contain resources or values of local importance such as water frontage, outstanding scenery, and outdoor recreation, or that maintain or stabilize local economies;
- that consolidate federal lands or reduce the miles of interior boundaries and number of interior corners;
- where the entire mineral estate is acquired with the surface estate or where acquisition will not include lands likely to go to patent under the 1872 Mining Law; and
- where needed to enhance public and administrative access to federal lands or to enhance recreation opportunities.

# **LRMP 2.21 Abandoned Mine Lands and Hazardous Materials**

#### **Desired Conditions**

- 2.21.1 Abandoned mine reclamation within the planning area does not negatively impact water quality and historic resource protection.
- 2.21.2 Abandoned mines do not endanger the environment, wildlife, the public, or employees
- 2.21.5 Over the life of the LRMP, AML closures for human safety at sites supporting bat populations include structures (such as bat gates) designed to provide for continued use as bat habitat.

# **Objectives**

- 2.21.7 Stabilize, rehabilitate, or restore AML on priority sites on an annual basis in order to improve water quality and watershed condition.
- 2.21.12 On all TRFO and SJNF lands, close or mitigate high-priority sites over the life of the LRMP. On SJNF lands, newly discovered sites will be prioritized for closure or mitigation based on hazard.

#### Standards and Guidelines

All applicable standards and guidelines are found within other sections of the Design Criteria, or are found in existing law, regulations, and policies.

# STIPULATIONS RELATED TO LEASING FOR OIL AND GAS DEVELOPMENT

# **Mexican Spotted Owl**

#### Lease Notice

A survey of the lease area may be required to determine if unsurveyed suitable habitat is present, and the agencies should prioritize completing surveys where expressions of interest have been made for leasable mineral development. A 2-year protocol survey to determine occupation by the species would be required prior to any development activity within the identified suitable habitat. Surveys would be completed by a qualified biologist as determined by USFWS and the managing agencies. No development activity would take place in resultant occupied habitat until a determination is made by the USFWS and the managing agencies for designation of a protected activity center.

# No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** In Mexican spotted owl habitat, as determined by biologist at the time, NSO would be allowed. Surveys of the lease area may be required to determine the presence of suitable habitat, occupation, and, if warranted, designation determination for a protected activity center.

If it is determined that suitable nesting and fledgling Mexican spotted owl habitat exists and surveys cannot be conducted, a TL would be placed from March 1 to August 31.

**For the purpose of:** Preventing actions which may result in take as defined under the Endangered Species Act.

**Justification:** The Mexican spotted owl is a threatened species with suitable habitat within portions of the SJNF and TRFO lands. NSO would be allowed in these habitat areas to maintain the utility of suitable

breeding and brood rearing habitat as defined in the Mexican Spotted Owl Recovery Plan to promote recovery.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupancy. No exceptions would be granted within a protected activity center.

**Modifications:** The Authorized Officer may modify habitat configuration or extent based on new information. Modification of a protected activity center would be completed in consultation with the USFWS.

**Waivers:** A waiver of this stipulation maybe granted by the Authorized Officer only through a land use plan amendment. No waivers shall be granted within designated protected activity centers.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# Lynx

# Controlled Surface Use – Landscape Linkage, Denning and Winter Foraging Habitat

Surface occupancy or use is subject to the following special operating constraints: Limitations on surface use and/or operational activities may be required. TL (especially during winter and/or in lynx habitat) and restrictions on snow compaction activities may be applied in consultation with the USFWS as necessary to protect habitat and linkage area function and limit access by potential lynx competitors. Actions would be consistent with direction found in the Lynx Conservation Assessment and Strategy, best available science as determined by the managing agencies and the USFWS, and/or the Southern Rockies Lynx Amendment, each where applicable.

#### On the lands described below:

- Within identified current active denning locations
- Within identified landscape linkage areas
- Within identified lynx habitat in a Lynx Analysis Unit (LAU)

For the purpose of: Protection of lynx and lynx habitat in compliance with the Endangered Species Act.

**Justification:** The Canada lynx is a threatened species, with suitable habitat within portions of the SJNF and TRFO. CSU would apply in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the USFWS, may grant an exception to this stipulation if an environmental analysis and subsequent consultation indicates that the proposed or conditioned activities would not affect, current and subsequent, suitability or utility of established lynx linkage corridors or lynx habitat within the LAU.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is non-essential to function and utility of established lynx linkage corridors and lynx habitat, and not impair the utility of the corridors and LAU for current or subsequent lynx use or occupation.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS, only through a land use plan amendment if site conditions have changed sufficient to preclude current and subsequent lynx occupation of the LAU or use of linkage corridors.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# **Timing Limitation – Denning Sites**

**No surface use is allowed during the following time period on the lands described below:** March 1 to August 30 (this stipulation applies to all lease activities) within 1 mile of known, active den sites.

For the purpose of: Protection of denning habitat for Canada lynx in compliance with the Endangered Species Act.

**Justification:** The Canada lynx is a threatened species with suitable habitat within portions of the SJNF and TFRO. A TL would apply in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception can be granted if an environmental analysis of the Proposed Action and subsequent consultation indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of habitat for current or subsequent reproductive activity or occupation.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size of the stipulation area or time frames if an environmental analysis shows that the modification would not impair the utility of the habitat and LAU for current or subsequent lynx reproductive activity or occupation.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# Southwestern Willow Flycatcher

# No Surface Occupancy

**No surface occupancy is allowed on the lands described below:** Within 325 feet of the ordinary high water mark in mapped habitat.

For the purpose of: Prevent disruption of reproductive activity in mapped habitat.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer in consultation with the USFWS, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect current or subsequent suitability or utility of riparian habitat suitable for the southwestern willow flycatcher.

**Modifications:** The Authorized Officer in consultation with the USFWS, may modify the configuration of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is currently and subsequently nonessential to the function and utility of riparian habitat, or that the Proposed Action could be conditioned so as not to impair the utility of habitat for the southwestern willow flycatcher.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Timing Limitation**

**No surface use is allowed during the following time period(s):** May 1 to August 15 in mapped suitable nesting habitat.

For the purpose of: Prevent disruption of reproductive activity during the production period.

**Justification:** The southwestern willow flycatcher is a federally designated endangered species with suitable breeding habitat within the planning area. Oil and gas activities have the potential to adversely affect the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the USFWS, may grant an exception if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success.

**Modifications:** The Authorized Officer, in consultation with the USFWS, may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current of subsequent nest attendance, egg/chick survival, or nesting success. Seasonal time frames may be modified if operations could be conditioned to not disrupt current or subsequent breeding behavior and bird distribution within suitable breeding habitat.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer in consultation with the USFWS only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# **Gunnison Sage-grouse**

#### Lease Notice

The lease may in part, or in total contain critical Gunnison sage-grouse habitat, as identified by the managing agencies, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas or geothermal operations on Gunnison sage-grouse populations and habitat quality.

Sage-grouse habitat conservation measures may include timing restrictions, noise restrictions, distances or percentages of allowable surface-disturbing activities, and desired density levels or other development constraints consistent with the state or Gunnison Sage-grouse Rangewide Conservation Plan (including subsequent updates), current peer reviewed sage-grouse research, or as developed in conjunction with CPW to meet local population objectives.

Such measures shall be developed during the Application for Permit to Drill on-site and environmental review process for sundry notices and associated rights-of-way, and would be consistent with lease rights granted.

#### No Surface Occupancy – Occupied Habitat

**No surface occupancy is allowed on the lands described below:** as mapped for occupied critical Gunnison sage-grouse habitat.

For the purpose of: Protecting priority habitat such as lek sites and nesting habitat for Gunnison sagegrouse.

**Justification:** Development and human activity are known to be limiting to occupation and successful reproduction of this species within its complex of suitable habitat. NSO may be used in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may be considered.

**Modifications:** A modification may be granted by the Authorized Officer if the occupied habitat boundaries change.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changed may be in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

### Controlled Surface Use -Occupied Habitat

*Surface occupancy or use is subject to the following special operating constraints:* The Field Manager may require the proponent/applicant to submit a plan of development that would demonstrate:

- Avoidance of direct or indirect loss of important Gunnison sage-grouse habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important Gunnison sage-grouse habitat necessary for sustainable local populations.
- Special reclamation measures or design features are incorporated that would accelerate recovery and/or re-establishment of affected sage-grouse habitat;
- The current/future utility of such habitat for sage-grouse use would not be impaired.

Additional conservation measures may be imposed as necessary to maintain high-quality sage-grouse habitat, reduce fragmentation or loss of habitat within or between population areas, reduce cumulative effects within population areas, and reduce disturbance to sage-grouse use in the area. Conservation measures may be identified in state or local conservation plans or through appropriate science or research for the species.

**Justification:** Loss of habitat is known to be among the factors limiting successful breeding, reproduction, and recruitment of this species within otherwise suitable habitat. The BLM and USFS, signatories to the Gunnison Sage-grouse Range-wide Conservation Plan (2005), have made commitments to limit noise associated with anthropogenic sources within priority habitats consistent with the LRMP.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in coordination with CPW, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the long term suitability or utility of habitat for sage-grouse.

Modifications: May be considered

**Waivers:** The Authorized Officer, in coordination with CPW, may grant a waiver to this stipulation if site conditions have changed sufficient to permanently preclude sage-grouse occupation of the lease area.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### Controlled Surface Use – Unoccupied Habitat

Surface occupancy or use is subject to the following special operating constraints: In unoccupied Gunnison sage-grouse habitat, NSO would be allowed within a 0.6-mile radius of a newly identified lek site. A TL may be applied to lease activities if surface occupancy is allowed. A TL may apply to construction, drilling, and workovers within 4.0 miles of an identified lek site from March 1 through June 30, dependent on the distribution of suitable nesting habitat and line of sight from the activity to the lek (potential habitat as identified in the Gunnison Sage Grouse Rangewide Plan, 2005). These are areas where Gunnison sage-grouse use is suspected or the habitat is deemed suitable but no grouse have been documented there. An agency approved survey of the lease acreage within "potential" habitat may be required to verify occupancy status.

For the purpose of: Protecting crucial habitat such as lek sites and nesting habitat for Gunnison sagegrouse.

**Justification:** The Gunnison sage-grouse is a BLM and USFS sensitive species, with suitable habitat and populations within portions of the SJNF and TRFO lands. Development and human activity are known to be limiting to occupation and successful reproduction of this species within its complex of suitable habitat. NSO may be used in these habitat areas to protect the habitat and the species.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer may grant an exception if an environmental analysis and coordination with CPW indicate that the Proposed Action could be conditioned so as not to affect current or subsequent breeding behavior, nest attendance, egg/chick survival, or nesting success. Actions designed to enhance the long-term utility or availability of nest habitat may be excepted.

**Modifications:** A modification may be granted by the Authorized Officer if the suitable habitat boundaries change. The Authorized Officer may modify the size or dates of the TL area if an environmental analysis indicates that the Proposed Action could be conditioned so as not to affect current or subsequent nest attendance, egg/chick survival, or nesting success. Seasonal or daily time frames may be modified if operations to not disrupt current or subsequent lek attendance, breeding behavior, and bird distribution within a 0.6-mile radius of the lek during the breeding period (March 1–June 30).

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# Controlled Surface Use – Noise Restriction Occupied and Unoccupied Habitat

Surface occupancy or use is subject to the following special operating constraints: New noise sources resulting from management activities must not contribute to noise levels exceeding 34 A-weighted decibels (dBA) (10 dBA above ambient measures, typically 20 to 24 dBA) from 6 p.m. until 9 a.m. at the perimeter of a lek during active lek season.

In occupied habitat the BLM would not authorize vehicular traffic between the hours of 6 p.m. and 9 a.m. within 1.9 miles of a lek from March 15 through May 15 annually. This stipulation applies to vehicles that may create noise levels that exceed recommended guidance.

**For the purpose of:** Protecting priority habitats such as lek sites, nesting, brood rearing, and winter habitat for Gunnison sage-grouse in order to prevent abandonment of display grounds and to maintain reproductive success, recruitment, and survival.

**Justification:** Noise associated with oil and gas operations and other similar development activity is known to be among the factors limiting successful breeding, reproduction and recruitment of this species within otherwise suitable habitat. The BLM and USFS, signatories to the Gunnison Sage-grouse Rangewide Conservation Plan (2005), have made commitments to limit noise associated with anthropogenic sources within priority habitats consistent with the Plan.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** The Authorized Officer, in consultation with the agency wildlife biologist and CPW, may grant an exception to this stipulation if other measures have been implemented sufficient to reduce the noise levels at the edge of the 0.6-mile lek buffer to a maximum of 10 dBA above ambient noise levels (measured at dawn) in an undeveloped area with no other anthropogenic sources of noise.

**Modifications:** A modification may be granted by the Authorized Officer if the lek and associated habitat boundaries change for this species.

**Waivers:** A waiver of this stipulation may be granted by the Authorized Officer only through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Colorado River Cutthroat Trout**

# No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within 0.25 mile of streams occupied by conservation populations of Colorado River cutthroat trout or streams that have been identified as reintroduction sites for Colorado River cutthroat trout.

For the purpose of: Protection of existing Colorado River cutthroat trout populations and habitat.

**Justification:** To assist in the recovery and conservation of Colorado River cutthroat trout populations in accordance with the 2001 Conservation Agreement and Strategy for the States of Colorado, Utah, and Wyoming. This species is both a USFS and BLM sensitive species. The Colorado River cutthroat trout is the only salmonid species native to western Colorado. Populations of cutthroat have declined over the past 100 years to where they now occur less than 5% of the area once occupied. The introduction of non-native trout species is the primary cause of the decline of endemic cutthroats. However, a variety of land management activities, resulting in the loss or degradation of their habitat, have also contributed to

the declines. The declines have been so severe that this subspecies of cutthroat has been petitioned for listing under the Endangered Species Act. The above stipulation would help promote the long-term recovery of the species and help reduce the trend towards federal listing.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions to this stipulation may be authorized if the affected area is determined not to be suitable habitat. Exceptions may also be granted when surface occupancy within the 0.25-mile distance of the Colorado River cutthroat trout conservation population or reintroduction sites would have no potential for adverse impacts on the habitat or population. Although these situations would be very rare, the Authorized Officer shall consider topography, hydrology, timing of surface activities, and all other relevant factors when evaluating an exception request.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Greenback Cutthroat Trout**

#### No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Within 0.25 mile of streams occupied by existing populations of greenback cutthroat trout.

**For the purpose of:** Protection of existing greenback cutthroat trout populations in compliance with the Endangered Species Act.

**Justification:** To assist in the protection of greenback cutthroat trout populations.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions can also be granted when surface occupancy within the 0.25-mile distance of the greenback cutthroat trout populations would have no potential for adverse impacts on the population. Although these situations would be very rare, the Authorized Officer shall consider topography, hydrology, timing of surface activities, and all other relevant factors when evaluating an exception request.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

# Perennial Streams, Water Bodies, Riparian Areas, and Fens

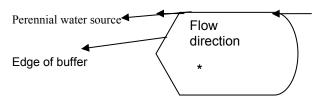
### No Surface Occupancy

**No surface occupancy or use is allowed on the lands described below:** Prohibit surface occupancy and surface-disturbing activities within a minimum buffer distance of 325 horizontal feet for all perennial waters. For perennial streams, the buffer would be measured from the ordinary high water mark (bankfull stage), whereas for wetland features, the buffer would be measured from the edge of the mapped extent (Table H.1). For unmapped wetlands, the vegetative boundary (from which the buffer originates) would be determined in the field. Where the riparian zone extends beyond 325 feet, the NSO stipulation would be extended to include the entire riparian zone.

Table J.B.1: No Surface Occupancy Buffers for Perennial Waters

Water Body Type	Buffer Width (feet)
Fens and wetlands	325*
Perennial streams (with or without fish)	325 (as measured from ordinary high water mark)
Lotic or lentic springs and seeps	325 (as measured from wetland vegetation edge)
Riparian	325 (or greater if riparian area is wider than 325 feet)

<sup>\*</sup>See Modification.



Wetland buffer dimensions may be averaged to accommodate variability in terrain or development plans. Up-gradient distances should be maintained (i.e., up- gradient buffer distances of 325 feet), while downgradient buffers may be reduced to no less than 100 feet. The buffer averaging must, however, not adversely affect wetland functions and values, and a minimum buffer distance of 100 feet from the wetland edge is maintained. The buffer's intent is to protect the water source area of the wetland, which is more important than the down-gradient portion of the wetland.

**For the purpose of:** Maintaining the proper functioning condition, including the vegetative, hydrologic and geomorphic functionality of the perennial water body. Protect water quality, fish habitat, aquatic habitat, and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

*Justification*: Wetlands, floodplains, riparian areas, water influence zones, and fens represent important ecological components and functions, such as storing water, stabilizing valley floors, enhancing water quality, and providing recreation and aesthetic values, biological diversity, and wildlife species with habitat, water, food, cover, and travel routes. They are easily disturbed by ground-disturbing activities that can cause soil erosion, soil compaction, and adverse changes to the hydrologic function that is important to maintaining the hydrologic and ecological integrity of these lands.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be allowed if the agency determines that project design or mitigation measures can be used to prevent impacts to reservoirs. Consideration must include the degree of slope, soils, importance of the amount and type of wildlife and fish use, water quality, riparian vegetation, and other related resource values. If wetlands are present around the reservoir, no exceptions would be granted unless compliance can be demonstrated with Executive Order 11990. In addition, an exception may be granted for stream crossings where no other alternative exists, such as another route, and must be approved by the Authorized Officer.

**Modifications:** Wetland buffer dimensions may be averaged to accommodate variability in terrain or development plans. Up-gradient distances should be maintained (i.e., up-gradient buffer distances of 325 feet), while down-gradient buffers may be reduced to no less than 100 feet. The buffer averaging must, however, not adversely affect wetland functions and values, and a minimum buffer distance of 100 feet from the wetland edge is maintained. The buffer's intent is to protect the water source area of the wetland, which is more important than the down-gradient portion of the wetland.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

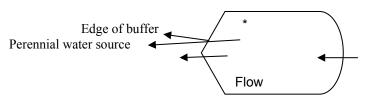
Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### **Controlled Surface Use**

Surface occupancy or use is subject to the following special operating constraints: From 325 to 500 horizontal feet from the perennial water body, CSU restrictions would apply. Surface-disturbing activities may require special engineering design, construction and implementation measures, including re-location of operations beyond 656 feet (200 meters) to protect water resources within the 325 foot NSO buffer. For perennial streams, the buffer would be measured from ordinary high water mark (bankfull stage), whereas for wetland features, the buffer would be measured from the edge of the mapped extent (Table H.2). For unmapped wetlands, the vegetative boundary (from which the buffer originates) would be determined in the field.

Table J.B..2: Controlled Surface Use buffers for perennial waters.

Water Body Type	Buffer Width (feet)
Fens and wetlands	325-500*
Perennial streams (with or without fish)	325–500 (as measured from ordinary high water mark)
Lotic or lentic springs and seeps	325–500 (as measured from wetland vegetation edge)



**For the purpose of:** Maintaining the proper functioning condition, including the vegetative, hydrologic, and geomorphic functionality of the perennial water body, to protect water quality, fish habitat, and aquatic habitat and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

**Justification:** Minimizing potential deterioration of water quality; maintaining natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities; and preserving wildlife habitat. The buffers are sized to accommodate the rivers' larger floodplains and wider riparian zones.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if a professionally engineered design is implemented and a construction, maintenance, and reclamation plan can mitigate to the fullest extent all potential resource damage associated with the Proposed Action.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

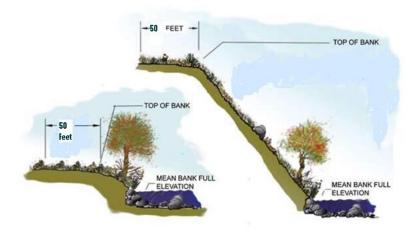
**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

### **Intermittent and Ephemeral Streams**

#### No Surface Occupancy

**No surface occupancy or use is allowed in the lands described below:** NSO of 50 horizontal feet as measured from the top of the stream bank for all intermittent or ephemeral streams (see diagram). If riparian vegetation extends beyond the top of the stream bank, the buffer would be measured from the extent of the riparian vegetation.



**For the purpose of:** Maintaining and protecting water quality, stream stability, aquatic health, seasonal use and downstream fisheries, and sediment processes downstream.

**Justification:** Minimizing potential deterioration of water quality and maintaining natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** Exceptions may apply if a professionally engineered design is implemented and a construction, maintenance, and reclamation plan can mitigate to the fullest extent all potential resource damage associated with the Proposed Action.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### Controlled Surface Use

Surface occupancy or use is subject to the following special operating constraints: CSU from the edge of the NSO buffer to 100 horizontal feet. Avoid locating roads, stream crossings, and facilities within this zone, because activities within this area can potentially affect streams and water quality. Adequate professional design and engineering of activities in this zone is necessary to prevent stormwater runoff and sedimentation. Measurement is from the top of the stream bank, although if wetland vegetation exists, then the measurement is from the vegetation's edge.

**For the purpose of:** Minimizing the risk of sedimentation, spills, and other contaminants reaching intermittent and/or ephemeral streams to protect water quality, stream function, and aquatic habitat.

**Justification:** CSU in this zone would minimize potential deterioration of water quality, maintain natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities.

Exceptions, modifications, and waivers would be considered for BLM leases. On NFS lands, the following exceptions, modifications, and waivers apply:

**Exceptions:** An exception may be granted by the Authorized Officer if it can be demonstrated that the surface-disturbing activity would cause only negligible impacts to the resource or resource use that the stipulation was designated to protect or would improve the protected resource or resource use as defined by LRMP objectives, standards, or conditions.

**Modifications:** No circumstances have been identified under which a modification would be allowed. A 30-day public notice and comment period is required before modification of a stipulation.

**Waivers:** No waivers would be authorized unless the areas mapped as possessing the attributes are verified by USFS staff to not possess those attributes. A waiver of stipulations may only be granted through a land use plan amendment.

Any changes to this stipulation would be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FSM 1950 and 2820.)

#### APPENDIX J.C – WATER DEPLETION ANALYSIS

### Water Depletions Associated with Livestock Grazing

The primary impact to fisheries and aquatic species would be mainly due to degraded habitat resulting from erosion and sedimentation and increased stream temperatures caused by long-term concentrated grazing in riparian areas where stream bank trampling and trailing, stream widening, and stream-side vegetation removal are occurring. Use of LRMP design criteria and referenced documents and manuals should ensure proper rangeland management and reduce the effects to fisheries and aquatic ecosystems.

The impacts related to livestock grazing on the bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker would generally be minor because these fish species do not occur within the planning area. With the exception of associated water-depleting activities, livestock grazing would not impact their habitats. The development of new stock watering features (stock ponds and springs) will result in minor water depletions to the San Juan and Dolores River Basins. It is unknown exactly how many facilities might be constructed over the life of the LRMP, but it is expected that the associated cumulative net depletion amount will be less than 5 acre-feet per year.

# Water Depletions Associated with Road Maintenance and Construction

Impacts related to roads and trails on stream flow and sediment production are more specifically described in the Water Resources Section of the LRMP.

Small amounts of water are used in road construction and reconstruction, road maintenance, and dust abatement, resulting in short-term water depletions to the San Juan and Dolores River Basins. This water would be obtained from federal and private sources and will include contracted actions (e.g., Schedule A maintenance by counties to apply magnesium chloride, etc.). Since this water is connected to a federal action, it is considered a discretional federal action subject to ESA Section 7 consultation requirements. It is estimated that these actions will use approximately 9 acre-feet from the San Juan River Basin and 6 acre-feet from the Dolores River Basin over a 15-year period, excluding road-related activities with gas well drilling and completion.

# Water Depletions Associated Oil and Gas Leasing and Development

The impacts related to oil and gas leasing and development on water quantity and water quality are discussed in the Water Resources Section in the LRMP. There are indications that oil and gas resource potential may result in leasing and exploration east of Pagosa Springs (in the San Juan Sag area) on NFS lands, and on the BLM portion (especially in the Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin, and along the Dolores River Canyon) and the NFS portion (especially in the Glade and McPhee Reservoir areas, and along the Dolores River Canyon) of the Paradox Basin. There are two types of possible gas development (i.e., conventional gas and GSGP gas) within the Paradox Basin. Exploration could include one to two wildcat wells per year in the San Juan Sag area. For conventional development in the Paradox Basin, four to seven exploratory gas wells per year may be developed on BLM lands for the 15-year period, and five to eight wildcat gas wells per year may be developed on NFS lands for the same period (see Fluid Minerals Section). For the GSGP development within the Paradox Basin, exploratory wells are slowly developed for the first 7 years, then accelerated development occurs. For BLM lands, two to three exploratory gas wells per year are constructed for the first 7 years, then nine to 24 gas wells per year are developed for the next 8 years. For NFS lands, six to eight wildcat wells are constructed for the first 7 years, then 37 to 68 gas wells per year are developed for the next 8 years.

In total, approximately 8 to 12 acres per year may be disturbed from well pads and roads on BLM public lands from oil and gas development activity for the first 7 years. For the next 8 years, about 36 to 96

acres per year may be disturbed. For all oil and gas development on NFS lands, approximately 24 to 32 acres per year may be disturbed from well pads and roads for the first 7 years. For the following 8 years, about 148 to 272 acres per year may be disturbed. If paying quantities of gas are discovered in the San Juan Sag and Paradox Basin (for both conventional and GSGP gas development), as many as 263 and 611 production wells are projected for BLM and NFS lands, respectively.

The potential impacts to aquatic ecosystems and fish species from oil and gas leasing and development would be mainly related to water depletions and some reduced stream flows. This would, subsequently, reduce fishery habitat available for use, increase sediment production, and result in degraded fishery habitat. Other potential effects include salinity and water contamination from petroleum products, drilling mud, and other contaminants. The major river basins affected by the projected development in the Paradox Leasing Analysis Area are the Dolores and San Juan River Basins.

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the GSGP and Paradox conventional development (Table J.19). GSGP gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acre-feet of water per well in the drilling and completion process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a CBM gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.

Table J.C.1: Projected Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased GSGP and Paradox Conventional Gas Wells over a Period of 15 Years for National Forest System

and Bureau of Land Management Lands by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing Alternative
USFS - Leased and unleased GSGP and Paradox conventional	5,311	5,032	4,556	5,300	832
BLM - Leased and unleased GSGP and Paradox conventional	4,265	3,726	3,593	4,107	2,480
Total	9,576	8,758	8,149	9,407	3,312

It is assumed that all water associated with GSGP and Paradox conventional gas development and production would be purchased and trucked into the project area, as the water would not be obtained from water sources on public land. The sources of this private water are unknown, but would occur within the San Juan River Basin and Dolores River Basin. Since this water is connected to a federal action, it is considered a depletion from a major river basin and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA (Table J.20 and Table J.21).

Water can also be depleted during gas field production. For the GSGP and Paradox conventional, small quantities of water are produced or pumped from the gas producing formation(s) in order to release the pressure on the gas tied-up in the seam and allow it to flow. In some cases as wells are drilled and the formation(s) fractured, groundwater may be connected to surface water streams. With the large number of gas wells proposed in the GSGP and Paradox conventional development (see Table J.20 and Table J.216), the amount of produced water removed may reduce some stream flows in stream systems with warm water sensitive fisheries or tributary to downstream threatened and endangered and sensitive

fishery streams. Because of difficulties in quantifying effects on stream flow, water depleted due to gas field production was not estimated for the GSGP and Paradox conventional.

Table J.C.2. Projected Number of Gas Wells and Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased GSGP and Paradox Conventional Gas Wells over a Period of 15 Years by Major River Basin for National Forest System and Bureau of Land Management Lands under Alternative A

	Future Leases	Future Leases	Existing Leases	<b>Existing Leases</b>
	Dolores River	San Juan River	Dolores River	San Juan River
	Basin	Basin	Basin	Basin
		USFS		
Number of wells	562	24	101	-
Water used (acre-	4,262	216	832	_
feet)				
		BLM		
Number of wells	229	34	326	25
Water used (acre-	1,490	296	2,256	224
feet)				
Total of water used	5,752	512	3,088	224
(acre-feet)				

Table J.C.3: Projected Number of Gas Wells and Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased GSGP and Paradox Conventional Gas Wells over a Period of 15 Years by Major River Basin for National Forest System and Bureau of Land Management Lands under Alternative C

	Future Leases	Future Leases	Existing Leases	<b>Existing Leases</b>
	Dolores River	San Juan River	Dolores River	San Juan River
	Basin	Basin	Basin	Basin
		USFS		
Number of wells	460	20	101	_
Water used (acre-	3,539	185	832	_
feet)				
		BLM		
Number of wells	147	20	326	25
Water used (acre-	928	185	2,256	224
feet)				
Total of water used	4,467	370	3,088	224
(acre-feet)				

Decreased stream flows may impact aquatic habitat and fish populations by reducing or eliminating both the extent and quality of suitable habitat by increasing stream temperatures and, subsequently, by reducing dissolved oxygen levels. Such impacts may be more pronounced during periods of natural cyclic flow reductions during fall and winter or during summer months during periods of drought. A loss of stream flow can also reduce a stream's ability to transport sediment downstream and result in increased deposition which, in turn, can impact the numbers and diversity of benthic macro invertebrates and, ultimately, aquatic habitat.

Clearing of drill pads and roads and their continued use can expose soil to both wind and water erosion. Given the number of well pads and roads projected in the Paradox Leasing Analysis Area, consequential sedimentation of streams and still water bodies has the potential to impact fishery and aquatic resources (Table J.22). These impacts may be more pronounced in the Paradox Basin because of the number of sensitive watersheds with sediment and salinity concerns that may be upstream of warm water sensitive fisheries or threatened and endangered species (Table 3.2 and Table 3.4 in the Water Section). Eroded material may be delivered to streams as fine sediment and deposited in channels or transported

downstream. The actual amount of sediment from these land disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type and the implementation and effectiveness of BMPs. A typical concern with sedimentation is that sediment loads, above background levels, can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

Table J.C.4: Projected Surface Disturbance (acres) for Leased and Unleased Gothic Shale Gas Play and Paradox Conventional Gas Well Development over a Period of 15 Years for National Forest System and Bureau of Land Management Lands by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Lease Alternative
USFS - Leased and unleased GSGP and Paradox conventional	3,570	3,395	2,770	3,555	530
BLM - Leased and unleased GSGP and Paradox conventional	3,070	2,688	2,590	2,920	1,780
Total	6,640	6,083	5,360	6,475	2,310

LRMP direction addresses potential aquatic impacts from surface disturbance. Where gas facilities are developed within the Paradox Basin, soil erosion and sediment deposition, and corresponding potential to impact aquatic and riparian habitat would be limited by implementing lease stipulations that require avoidance of sensitive, erosion-prone areas and riparian areas, secondly by using standards and guidelines, and thirdly by the application of BMPs. Some of these BMPs may include, for example, graveling road surfaces to avoid dust and loss of soil to wind erosion; revegetating or covering any soil stockpiles that would remain for extended periods to avoid significant wind and water erosion; installing slope breaks and silt fences on slopes to slow and filter storm water runoff that might carry exposed soils to surface water drainages; timely reclaiming disturbed areas to minimize erosion after construction of facilities; and avoiding locations having highly erosive soils where possible. Non-productive wells would also be immediately reclaimed. The applicable lease stipulations to protect aquatic ecosystems and fish species are below (Table J.23).

Table J.23: Lease Stipulations that Pertain to the Aquatic Ecosystem and Fish Species as Applied by Alternative

Fisheries	Alt A	Alt B	Alt C	Alt D
Perennial streams, water bodies, riparian areas, and fens: Prohibit surface occupancy and surface-disturbing activities within a minimum buffer distance of 325 horizontal feet for all perennial waters. See Appendix H for full description of distances where NSO applies.	NSO	NSO	NSO	CSU
Perennial streams, water bodies, riparian areas, and fens: From 325 to 500 horizontal feet from the perennial water body, controlled surface use restrictions would apply. See stipulations for full description of distances where CSU applies.	CSU	CSU	CSU	SLT
<b>Reservoirs and lakes</b> For reservoirs and lakes 1 acre or larger as measured by the high water mark,	NSO	NSO	NSO	CSU

Fisheries	Alt A	Alt B	Alt C	Alt D
NSO would be allowed within 0.25 mile of the high water shoreline.				
Colorado River cutthroat trout (sensitive species): Within 0.25 mile of streams occupied by conservation populations of Colorado River cutthroat trout or streams that have been identified as reintroduction sites for Colorado River cutthroat trout.	NSO	NSO	NSO	CSU
<b>Greenback cutthroat trout (threatened species):</b> Within 0.25 mile of streams occupied by existing populations of greenback cutthroat trout.	NSO	NSO	NSO	NSO

NSO = No Surface Occupancy; CSU = Controlled Surface Use; SLT = Standard Lease Terms.

Another potential impact to fisheries from the projected gas development and production would be the potential for various chemical leaks and spills. This impact has been addressed previously in the Water Resources section of this chapter and is mitigated through the use of BMPs that apply to well drilling operation maintenance and material handling.

In regard to air quality (see Section 1), the effects on aquatic ecosystems and fish species would be negligible over the life of the LRMP. The air analysis was focused on the entire planning area, not just the Paradox Leasing Analysis Area. It is a modeling effort with many assumptions, including a gas development scenario as depicted in the Reasonable Foreseeable Development (RFD) scenario. The potential impacts of nitrogen loading or sulfur dioxide deposition to lakes, streams, and the aquatic ecosystems and fish species would be a very slow and prolonged process. It would be very difficult to detect any measureable effects on aquatic ecosystems well beyond the life of the LRMP.

### **Cumulative Impacts**

The cumulative impacts to aquatic ecosystems of ongoing basin-wide water development activities have played a major role in the decline of the bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker. The primary cumulative impacts to these species would occur as the result of LRMP and project-level decisions that lead to further water depletions. These activities would primarily be due to the reauthorization of existing uses, authorization of new water development projects, and to gas development and production from current and private mineral estate leases. Gas development on private and State mineral estate development may add an additional 810 wells to those projected for development on federal mineral estate in the Paradox Basin. These private and State well numbers equate to 6,540 acre-feet and 166 acre-feet of water used for drilling, fracturing, and completion for the GSGP gas development and Paradox conventional gas development, respectively. For the San Juan Sag (within the San Juan River Basin), existing leases on national forest lands are estimated to have used 7 acre-feet for well drilling and completion. Existing leases for the San Juan Basin CBM and conventional gas wells are estimated to have used 160 acre-feet and 14 acre-feet of water, respectively, for BLM lands, and 487 acre-feet and 42 acre-feet of water, respectively for national forest lands. Private and State mineral estate development may use an additional 722 acre-feet of water for CBM gas wells in the San Juan Basin. The water usage estimates for the above San Juan Basin CBM gas wells (all ownerships) also includes gas production -induced depletions of river and stream flow.

Water is produced in conjunction with the production of CBM gas in the Northern San Juan Basin. Within the Basin in Colorado there are concerns that the removal of water from the tributary Fruitland – Pictured Cliffs aquifer may result in stream depletions that impact downstream water users and fisheries. These concerns have prompted four studies spanning 2000 to 2009 which quantify groundwater/surface water impacts and their interactions:

 Applied Hydrology Associates, Inc. 2000. 3M Project, San Juan Basin, Colorado and New Mexico, Hydrologic Modeling Report. Prepared for the Southern Ute Indian Tribe, Colorado Oil

- and Gas Conservation Commission, and the Bureau of Land Management.
- Cox, D., P. Onsager, J. Thomson, R. Reinke, G. Gianinny, C. Vliss, J. Hughes, and M. Janowiak. 2001. San Juan Basin Ground Water Modeling Study: Ground Water – Surface Water Interactions between Fruitland CBM Development and Rivers. Sponsored by the Ground Water Protection Research Foundation.
- 3. S.S. Papadopoulos and Associates Inc. in conjunction with Colorado Geological Survey. 2006. *Coalbed Methane Stream Depletion Assessment Study Northern San Juan Basin, Colorado.* Sponsored by State of Colorado.
- 4. Norwest Corporation. 2009. *Northern San Juan Basin Groundwater Modeling Project -Final Report.* Sponsored by BP American Production Company, Chevron U.S.A. Inc., Conoco Phillips Company, the Southern Ute Indian Tribe, and XTO Energy Inc.

The 3M model (Applied Hydrology Associates) (*study 1*)) simulated the primary streams that cross the Fruitland-Pictured Cliffs aquifer outcrop as receiving discharge water from the Fruitland-Pictured Cliffs aquifer. Estimated total discharge to the rivers crossing the outcrop in Colorado—which includes the Animas, Florida, Los Pinos, Piedra, and the San Juan Rivers—were estimated to equal approximately 200 acre-feet/year. CBM development could deplete all or some portion of this total.

The Cox et al. study (*study 2*) estimated CBM development depletions from the Animas, Florida, and Los Pinos Rivers. The model first simulated pre-CBM development discharge from the Fruitland-Pictured Cliffs aquifer into the three rivers as approximately145 acre-feet/year. Cox et al. then calculated that the depletion to the three rivers due to CBM water production projected to 2005 would be up to 95 to 100 acre-feet/year. Data did not permit a model to be constructed to evaluate depletion from the Piedra River and Stollsteimer Creek, but projection of results from the area west were used to provide an estimate of 15 to 60 acre-feet/year of depletion from the Piedra-Stollsteimer system by 2050.

According to the S.S. Papadopulos and Associates 2006 modeling (*study 3*), the riverine depletion as of August 2005 from the CBM wells producing within the Basin in Colorado was modeled to be about 155 acre-feet/year. This quantity does not differ greatly from the above depletions calculated in the 2001 Cox et al. study for the Animas, Florida, and Los Pinos Rivers . Stated differently, riverine depletions are approximately four to 5% of CBM well water produced. The current CBM water production rate from wells operating in the San Juan Basin in Colorado is approximately 3,000 acre-feet/year.

The Norwest report (*study 4*) applied a more conceptually complex treatment to the various layers of the Fruitland and Pictured Cliff Sandstone Formations, while also incorporating 12 perennial streams that have outcrop contact. The study found that in 2007 discharges to surrounding streams were approximately 100 acre-feet/year, which is consistent with the values from studies 1, 2, and 3.

To evaluate future depletions, S.S. Papadopulos and Associates projected further development of CBM resources beyond 2005 based on information provided in well spacing orders for the Fruitland Formation. on the selected alternative for the FEIS for the Northern San Juan Basin (USFS and BLM, 2006), and on the basis of information provided by Colorado Oil and Gas Conservation Commission (COGCC) personnel. COGCC spacing orders included 80-acre infill development within portions of the Southern Ute Reservation. Two related scenarios were modeled: in the first scenario, all potential future wells were included in the analysis, for a total of 1,516 wells; in the second scenario, wells within a 1.5 mile buffer along the outcrop were omitted. This second scenario recognizes current COGCC prohibitions on drilling within 1.5 miles of the outcrop; under it. 1.155 future wells were installed. Using these assumptions. depletion curves for currently operating wells and under both buffered and unbuffered future well scenarios were determined. These curves indicate that the depletion rate for existing wells would peak in about 2020 at 164 acre-feet/year and that by 2070 depletions would drop below 100 acre-feet/year. Under the buffered future well scenario (i.e., no wells within 1.5 miles of the outcrop), depletions would peak in approximately 2035 at 171 acre-feet/year, and would drop below 100 acre-feet/year by 2150. These depletion estimates are relatively low compared to flows in the rivers. The combined base flows for the Animas, Florida, and Pine Rivers average nearly 200,000 acre-feet/year (Cox et al. 2001).

Our RFD scenario for CBM in the Northern San Juan Basin includes 450 wells to be developed at 80-acre spacing on existing leases. Relying on the above study parameters, to estimate the effects of the RFD,

we assumed 50 barrels/day of produced water per well, or 2 acre-feet/well/year, depletions are approximately 4% of water produced, and that approximately, 40% of projected development would occur on federal mineral estate.

Consequently on BLM lands for infill CBM development and production, about 103 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and river, over the next 15 years. On NFS lands, approximately 241 acrefeet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and rivers over the next 15 years, due to infill CBM development and production. Private and state mineral estate development may use an additional 516 acre-feet of water over the next 15 years for infill CBM development and production.

Future development in the Northern San Juan Basin would occur on existing oil and gas leases, most of which have already been developed. The decision as to whether the existing lease can be developed is a function of project level decision-making and subject to the rights granted by the associated leases. Consequently, federal lease development in the Northern San Juan Basin is not considered a direct effect of the LRMP decisions, but is considered an indirect impact and addressed in cumulative effects analysis.

Due to heightened concerns about sediment and salinity inputs and subsequent downstream impacts to fishery habitat quality, ground-disturbing activities (including new road construction and well pads) in the Dolores River watershed may also adversely impact these endangered species. Stipulations and BMPs for oil and gas development, as described previously and in the Water and Soils sections of the FEIS, should reduce the potential for measurable sedimentation. Since the exact details for these projects and activities are presently unknown, the impacts continue to be speculative. In addition, water used in road construction and reconstruction, road maintenance, and dust abatement may also impact these endangered species.

# Appendix K Fire Regime and Condition Class

#### FIRE REGIME AND CONDITION CLASS

Fire regimes describe the historical ecological role of fire in creating and maintaining vegetation communities for a period before Euro-American settlement activities and active fire suppression began. Fire regimes, or more generally, disturbance regimes, are a key component of historical range of variability (HRV) characterizations for forest and vegetation types. HRV reference conditions are also the basis for developing desired future conditions, which can be used as guidelines in developing program strategy and designing fuels restoration projects.

This discussion focuses on fire; however, we acknowledge the role of other disturbances, but do not directly deal with them. Fire Regime Condition Class (FRCC) is a standardized interagency tool that utilizes the concept of HRV to assess a current landscape's departure from historical (natural) conditions (Hann et al. 2003). The fire regime description includes HRV characterizations of our local forest or vegetation type and their assigned biophysical group as defined by FRCC protocol. Fire regimes are typically described by fire frequency, intensity, size, and vegetation type (Heinselman 1981; Sando 1978):

Vegetation types by fire regime are listed in Table K.1 based on FRCC definitions (Hann et al. 2003). Existing vegetation types are found in the in the Vegetation Diversity section of this appendix, which describes current vegetation and the potential natural vegetation community that would develop in the absence of disturbance. However, each existing vegetation type has experienced a characteristic pattern of succession and natural disturbances (e.g., fires, insect outbreaks) that occurred at varying intervals and characteristic intensities. These natural disturbances were key to maintaining a diversity of seral communities, and therefore a variety of plant and wildlife habitat across the landscape.

Local data are preferable for determining local fire regimes and the San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO) are developing a local fire-history database for the planning area's major fire-dependent vegetation types. Our most extensive data are for the ponderosa pine and warm-dry mixed conifer types (Brown and Wu 2005; Grissino-Mayer et al. 2004; Romme et al. 2001; Wu 1999). Local or regional data for aspen, cool-moist mixed conifer, and pinyon-juniper are also available (Floyd et al. 2004; Floyd et al. 2000; Grissino-Mayer et al. 2004; Romme et al. 2001; Wu 1999). Where local data are lacking, relevant literature and expert input were used to create the following regime descriptions.

Table K.1: Historic Fire Regimes for the San Juan National Forest and Tres Rios Field Office Geographic Area

Fire Regime Class	Frequency (fire return interval)	Severity	Existing Vegetation Types	Acres	% of Planning Area
I	0–35+ years,	Predominantly low	Ponderosa pine	411,790	11%
	frequent		Warm-dry mixed conifer	95,392	3%
II	0–35+ years,	Replacement	Mountain grasslands	304,314	8%
	frequent		Semi-desert shrubland	95,380	3%
			Sagebrush shrublands	210,030	6%
III	35–100+ years, less infrequent	Mixed and low	Cool-moist mixed conifer	199,412	6%
IV	35–100+ years,	Replacement	Aspen	346,384	10%
	less infrequent		Mountain shrubland	450,190	12%
			Semi-desert grassland	301,538	8%

<sup>&</sup>lt;sup>1</sup> Fire Regime Condition Class (FRCC) is a standardized interagency tool for assessing a current landscape's departure from historical (natural) conditions (Hann et al. 2003). Historical or reference period is defined as the time period when ecosystems along with their natural disturbance regimes were still intact and functioning in sustainable landscapes before Euro-American settlement activities. Current condition departure assessments are based on fire frequency and intensity, current species composition, structural stage, age and canopy closure, and fuel accumulations compared to conditions under the historic disturbance regimes.

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Fire Regime	Frequency (fire	Severity	Existing Vegetation	Acres	% of
Class	return interval)		Types		Planning
					Area
			Semi-desert shrubland	95,380	3%
			Riparian and wetland	77,964	2%
V	200+ years	Replacement and other	Spruce-fir	510,220	14%
		fires occurring within	Pinyon-juniper woodland	444,147	12%
		this frequency range	Alpine	186,494	5%

### Fire Regime I (Low Severity, 0-35+ Years)

This regime applies to **ponderosa pine** and warm-dry mixed **conifer** forests.

#### Historical Range of Variability Fire Regime and Forest Structure

Local studies have shown these forests were dominated by frequent surface fires. The reference period for these studies spanned from the mid-1600s to the present. Smaller, spatially localized fires occurred on the order of one or more times a decade (6–10 years). Landscape-scale fires or fires that burn larger areas occurred less frequently, but still on a "short" decadal time scale (13–30 years) (Brown and Wu 2005; Grissino-Mayer et al. 2004).

The warm-dry mixed conifer is similar to ponderosa pine stands having the same general type of stand structure and similar fire regime with slightly longer fire intervals and denser forest conditions than ponderosa pine.

#### Current Conditions - Ponderosa Pine

Fire exclusion across the lower-elevation forests started in the late 1800s to early 1900s, first because of heavy livestock grazing and later because of fire suppression (Covington and Moore 1994; Grissino-Mayer et al. 2004; Swetnam and Betancourt 1999). Grazing, fire suppression, and logging have greatly changed the structure of our ponderosa pine forests. The general pattern observed in stand structure is an overall densification of forests and homogenization of forest structure across the landscape. Instead of being predominantly open forest structure with groups and clumps of large trees, much of the ponderosa pine now has dense, continuous canopies lacking size and age diversity.

# Current Conditions - Warm-dry Mixed Conifer

The pattern in warm-dry mixed conifer has added complexity, due to the presence of competing tree species. Fire exclusion has caused forest densification and a shift in tree species dominance from ponderosa pine (*Pinus ponderosa*) toward white fir (*Abies concolor*) and Douglas-fir (*Pseudotsuga menziesii*). Historically, fire gave ponderosa pine a competitive edge over the other species found in the warm-dry mixed conifer.

### Fire Regime II (Replacement, 0–35 Years)

# Natural History

Reconstructing historic fire intervals for grasslands is problematic because no evidence for empirical research has lasted, such as basal fire scars. However, it is reasonable to assume that the fire frequency in grassy meadows is largely linked to the forests surrounding it. If the forest type burned often, as ponderosa pine forests did, then the meadows probably burned relatively often as well. Meadows at higher elevations in forest types that have longer fire intervals would burn less often. In addition, Native Americans may have burned meadow areas regularly to maintain pasture for their animals or game, or to promote specific plants, creating areas of locally increased frequency.

Mountain grasslands were probably always associated with forests even during the reference period, and fire appears to have played a maintenance role. Periodic fires would have prevented encroachment from woody species and renewed bunch grasses by removing the buildup of dead plant material.

#### **Current Conditions**

Today, mountain grasslands occur as openings in forest-dominated landscapes (see Ecosystem Diversity). During the historic reference period (pre-1900), ponderosa pine stands were more open and park-like, having an abundant herbaceous understory. Forest densification in ponderosa pine has decreased grass cover to the point of exclusion in the densest stands and the pattern may be similar in warm-dry mixed conifer. No formal assessment of meadow encroachment has been conducted in the planning area, but the pattern of forest densification in ponderosa pine strongly suggests that grassy understories have greatly diminished compared to the reference period.

### Fire Regime III (Mixed Severity, 35–100+ Years)

This regime applies to **cool-moist mixed conifer**. Cool-moist mixed conifer forests are generally found between the warm-dry mixed conifer and spruce-fir forests with aspen intermixed throughout. This vegetation type is a complex, heterogeneous band of forest where trees and understory of the wet and dry extremes mix, depending on specific site conditions. Drier sites can have small amounts of ponderosa pine, while white fir and Douglas-fir dominate wetter sites.

#### **Natural History**

Forest studies have shown that fire intervals range in the multi-decadal to century time scale in the coolmoist mixed conifer, with evidence of both surface and crown fire (Grissino-Mayer et al. 2004; Wu 1999). Fires in cool-moist mixed conifer forests were not fuel-limited systems because these productive mesic sites always have enough live and dead fuels to carry fire. Fuel moisture, linked to climate, was the most limiting factor. Intra-annual drying (i.e., seasons) creates a potential for fire in most years. During typical seasonal climate and weather patterns, fires were probably predominantly surface fires with limited high-intensity patches. The sizes of those fires ranged from small to large. Larger fires with a greater ratio of crown fire to surface fire area would burn in significantly dry years. Overall size, intensity, and severity of any fire would depend on fuel moisture, weather conditions, and climate context. This fire regime promotes a complex and heterogeneous forest.

#### **Current Conditions**

Forest fuel loading in terms of woody debris and live biomass have increased over the period of fire exclusion. The increases, however, are not necessarily out of HRV on stand level. HRV concerns are for diversity in tree species and seral stages across the cool-moist mixed conifer on a landscape level. The landscape structure was probably more diverse during the pre-1900 reference period with early to late seral stands in various proportions, and more variety in stand densities than what is observed on the landscape currently. Periodic surface and crown fires are particularly important to the persistence of ponderosa pine and aspen stands in this landscape.

Ponderosa pine is a small yet important component of the cool-moist mixed conifer, occurring where fires burned more frequently due to topography, aspect, or warm climatic periods that supported more fire. The individuals or small groups are likely to disappear over time from old age, insects and disease, or crown fire under current conditions.

Aspen stands are aging uniformly within the cool-moist mixed conifer landscape. In the past, periodic fires would have renewed these stands. If the aspen stands are to persist over the long term, they will need to burn again. Current aspen distribution is probably not outside HRV conditions (Romme et al. 2001), and mixed-severity fires under normal fire weather conditions could adequately rejuvenate the patch mosaic over time.

#### Riparian and Wetlands

Information about disturbance is scarce for these vegetation types; fire frequency is influenced by the vegetation type surrounding them. Thus riparian and wetland areas in the subalpine zone will rarely burn compared to those found in ponderosa pine forests. Riparian areas and wetlands in lower elevations probably did not burn as often as their surrounding vegetation because of persistent mesic conditions. Therefore, the occurrence of fires is most likely controlled by drought. Native burning may have played a role in these areas, but that topic must be researched.

# Fire Regime IV (Stand Replacement, 35–100+ Years)

### Mountain and Sage Shrublands, Semi-desert Shrub and Grasslands

Mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter intervals than 35 years can probably occur.

Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive of these sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and giving them a greater potential to burn more often than semi-desert systems.

#### **Natural History**

The only pre-1900 fire history data available for any mountain shrublands in the study area come from a study conducted in Mesa Verde National Park (Floyd et al. 2000). Floyd and colleagues calculated a 100-year fire-rotation period for Gambel oak (*Quercus gambelii*) (the time to burn an area equal to the total extent of shrubland in the study area). One hundred years may pass and all of the Gambel oak in the Mesa Verde study area could burn at once, or patches of various sizes could burn in the study area until an area equal to the study area has burned. In this latter scenario, some stands may burn more than once, while others may completely escape burning during that 100-year period. This scenario is reasonable, given the frequency that favorable fuel and weather conditions for fire occur.

#### **Current Conditions**

Further study on Gambel oak fire frequency and landscape structure is warranted because it occurs across a large elevational gradient across the SJNF and TRFO. Furthermore, the fire rotation found at Mesa Verde National Park may not hold true across the planning area. The Gambel oak in Mesa Verde National Park is associated with pinyon-juniper woodlands, which burn less often than Gambel oak. Gambel oak is also associated with ponderosa pine, warm-dry and cool-moist mixed conifer, and also occurs in extensive stands of Gambel oak alone.

Sage shrublands are assumed to function similarly to Gambel oak shrublands. Regional studies from the Great Basin, Montana, and Oregon have reported a range of fire intervals, mostly in the multi-decadal time scale. There is limited localized information for the planning area; however, there is an adequate basis for assuming that fire played a large role in structuring sagebrush ecosystems much as fire does in other major vegetation types.

In summary, more productive shrublands such as Gambel oak are not seriously outside their HRV in terms of fire intervals; however, landscape diversity of patch sizes and seral stages should be of concern. Sage shrublands and the semi-desert grass and shrublands are also not outside HRV. However, these drier ecosystems are currently experiencing an invasion of cheatgrass (*Bromus tectorum*). Cheatgrass is not only crowding out native vegetation, but will also alter this low-frequency fire regime to a high-

frequency one by creating a fine-fuel bed able to carry fire more frequently and extensively than during the reference period.

#### Stable and Seral Aspen

Fire Regime IV also includes stable and seral aspen.

#### **Natural History**

The importance of fire to aspen regeneration is well documented (Figure K.1). Romme et al. (2001) conducted a landscape assessment of aspen on the west side of the SJNF. The researchers found a fire occurred in every decade from 1740 through 1910 within their 30-square-mile study area, with stands establishing in every decade from the 1760s through the 1870s. They calculated the median age of aspen stands to be 70 years in 1880 and interpreted the fire rotation to be 140 years for an area equal to the study area to burn. An individual stand may go more than a century before burning, whereas another could re-burn at a much shorter interval.

These data show that fires occurred frequently across an aspen landscape. Significant climatic events (drought) could synchronize large areas of aspen, but stands would diversify again over time, with subsequent random fire occurrences and burn patterns.

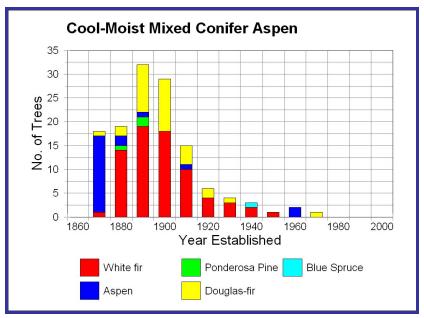


Figure K.1: Cool-Moist with Aspen Age and Fire History

#### **Current Conditions**

Current aspen distribution does not differ greatly from the 1880 landscape (Romme et al. 2001). Continued fire exclusion could cause a decrease in aspen on the landscape if clones become so decadent over time that their underground root systems die with no overstory stems to maintain them. However, no conclusive information is available about the duration for which aspen roots remain viable. Small stems that go undetected may be able to sustain root systems for many years.

# Fire Regime V (Stand Replacement, 200+ Years)

This regime applies to forest or vegetation types that rarely burn, due to fuel or moisture limitations. On the SJNF and TRFO, spruce-fir and pinyon-juniper forests seldom burn.

#### Spruce-fir

Cold-wet mixed conifer and spruce-fir are assumed to have the same fire regimes. Romme et al. (2001) estimate centuries passed between fires in a spruce-fir stand on the landscape. The authors could not determine exact fire intervals, because too many of their sampled stands were too old to estimate the time since the last fire. A summary of their age structure data does show that mature (>150 years) spruce-fir stands were common on the landscape during the reference period (pre-1900). Young stands (<100 years) made up just less than 40% of the landscape and a small amount of the landscape was of intermediate ages (100–150 years). No significant fires have burned in their study area since their reference period; therefore, their entire study landscape has aged over 100 years.

Spruce-fir forests with such long fire intervals do not have quantifiable landscape equilibrium in stand structure or age over practical management time scales. Old or young stands will dominate a landscape depending on when the last major fires burned. Aspen stands within the spruce-fir are a concern: they must burn or be succeeded by conifer. Questions remain about how long an aspen clone can remain viable without fire. Overall, the spruce-fir landscape is likely within HRV limits in its current condition.

#### Pinyon-juniper

Pinyon-juniper woodlands also have very long fire intervals. The fire-rotation period for stands in Mesa Verde National Park is about 400 years, while some have not burned for 700 years (Floyd et al. 2000). Another study from the Uncompander Plateau estimates pinyon-juniper fire intervals to be 200–1000 years (Eisenhardt 2004).

Long fire intervals seem unlikely for forests that experience hot, dry summers with ample lightning strikes. Unlike the spruce-fir that is typically too wet to burn, pinyon-juniper forests often do not have the fuel continuity for fires to spread easily. These stands have scant herbaceous understory to lay the fine-fuel bed fires would need to spread. Only wind-driven fires burn significant numbers of acres.

These pinyon-juniper forests have not been affected by fire suppression, and they appear to be within their HRV. However, noxious weeds pose a threat to their ecological integrity. Cheatgrass has proliferated throughout the planning area's pinyon-juniper, especially in beetle-killed stands, introducing surface fires to this forest type. The long-term ecological consequences are serious, because cheatgrass is such an aggressive colonizer and fire appears to promote it. Its presence will increase fire frequency, and its persistence may delay or completely alter typical post-fire successional pathways in pinyon-juniper woodlands.

Pinyon-juniper shrublands are common throughout the SJNF and TRFO. Sagebrush (*Artemisia* sp.) is found on dry, low-elevation sites and Gambel oak on moister, higher-elevation ones. Fires may burn more often in the shrubland type than the forest type, because the shrubs and trees would develop a continuous fuel complex more quickly. The shrubland type may have been moderately affected by fire suppression, decreasing the diversity of the over- and midstory structure across the landscape. As in the pinyon-juniper woodland, noxious weeds are a serious problem. Cheatgrass, especially, will promote more frequent fire. If fires do burn, the post-fire successional trajectory will be altered, with cheatgrass or thistle dominating the stand.

#### **Condition Class**

The first step of FRCC characterizes historical (natural) conditions for vegetation types that are the reference conditions used to assess whether a landscape (forest type) is outside its HRV. The second step of FRCC is the condition class assessment of a landscape's degree of departure from its historical (natural) conditions. For the SJNF and TRFO geographic area, the reference period for this analysis spans the seventeenth to late nineteenth centuries (1700s–1800s). This period is based on the most reliable span in fire history data. The reference period is the time period when ecosystems along with their natural disturbance regimes were still intact and functioning in sustainable landscapes before Euro-American settlement activities. Tree-ring fire chronologies show the last widespread fire occurred in the 1880s. The year 1890 is a good date to designate the beginnings of fire exclusion (Brown and Wu 2005;

Grissino-Mayer et al. 2004; Wu 1999). Current condition departure assessments are based on missed or increased fire occurrences, uncharacteristic fire behavior, current species composition, structural stage, age and canopy closure, and fuel accumulations compared to conditions under the historic disturbance regimes.

Table K.2 defines the three FRCC condition classes. Low departure (FRCC1) is considered to be within HRV. Moderate departure (FRCC2) indicates that components of the fire regime, such as fire frequency, have been altered, resulting in changes in vegetation and landscape patterns. These areas may require varying levels of management actions before fire can be restored and allowed to plays its historical natural role.

Table K.2: Fire Regime Condition Class Descriptions

<b>Condition Class</b>	Descriptions
FRCC1	Fire regimes are within the historical range and the risk of losing key ecosystem components is
	low. Vegetation attributes (species composition and structure) are intact and functioning within
	their historical range.
FRCC2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies
	by one or more return intervals (either increased or decreased). This may result in moderate
	changes to one or more of the following: fire size, intensity, severity, and landscape patterns.
	Vegetation attributes have been moderately altered from their historical range.
FRCC3	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This may result in dramatic changes to one or more of the following:
	fire size, intensity, severity, and landscape patterns. Vegetation attributes have been
	significantly altered from their historical range.

High departure (CC3) means that fire regimes and vegetation are significantly altered from historical conditions. Uncharacteristic fire behavior and fire effects will occur under certain conditions, resulting in vegetation composition and assemblages not known to exist during reference conditions. Condition class is a calculated number and the protocols are outlined in the FRCC Guidebook v1.2 (Hann et al., 2003). However, the SJNF and TRFO's condition class map presents assigned FRCC values based on a vegetation polygon's type and fire regime and will be updated with the new FRCC map when available.

Table K.3 shows each major vegetation type by its assigned FRCC. More detailed HRV discussion is found in the Fire Regime section above. In general, ecosystems with longest return-fire intervals, such as spruce-fir and pinyon-juniper, have not missed fire intervals, and therefore on a stand level their structure and species composition is well within estimated HRV conditions. From an ecological perspective, fires can be allowed to burn in these forests under any conditions and they will burn with characteristic intensity with characteristic effects. Some concerns about landscape structure and mosaic exist and need to be assessed, but because of the very long fire intervals the landscape is probably still within HRV. Thus spruce-fir is in FRCC1. Pinyon-juniper is in FRCC2. Even though its fire regime and macro woody structure is intact, pinyon-juniper is only considered FRCC2 because of grazing, chainings, and degraded herbaceous composition. The current cheatgrass invasion may push pinyon-juniper further out to FRCC3 over time. Cheatgrass cover will introduce frequent surface fire to this low-frequency, high-intensity fire regime and alter post-fire successional pathways.

Aspen is currently assigned to FRCC1, but is trending towards FRCC2. The current distribution and age structure across the landscape is an assemblage within HRV; however, it appears to be on the longer extreme of its HRV. Many stands succeeding to conifer would benefit from burning to regenerate the stands. An important question to aspen persistence on the landscape is how long a clone can remain viable after its last stand-replacement fire.

Cool-moist mixed conifer is assigned to FRCC2 because, although it has missed some fire intervals, its vegetation composition and landscape mosaics are still within HRV, with fires still behaving

characteristically and producing characteristic effects. This is true for the other vegetation types listed in FRCC2; however, the semi-desert vegetation types and sagebrush type are threatened by cheatgrass and other noxious weeds and have the same situation described for pinyon-juniper.

Table K.3: Fire Regime Condition Class by Existing Vegetation Type

FRCC (assigned)	Existing Vegetation Type	Acres of Public Lands	% of Public Lands
1	Spruce-fir	510,220	14
	Alpine	186,494	5
	Aspen	346,384	10
2	Cool-moist mixed conifer	199,412	6
	Mountain grasslands	304,314	8
	Mountain shrubland	450,190	12
	Pinyon-juniper woodland	444,147	12
	Semi-desert grassland	301,538	8
	Semi-desert shrubland	95,380	3
	Sage shrublands	210,030	6
3	Ponderosa pine	411,790	11
	Warm-dry mixed conifer	95,392	3
0	Riparian and wetland	77,964	2

Ponderosa pine and warm-dry mixed conifer are both frequent surface fire regimes and have been the most affected by fire suppression, logging, and grazing since Euro-American settlement; therefore, they are assigned to FRCC3. They have missed numerous fires relative to historic patterns, their stand structures are overly dense, understory herbaceous life is degraded, and white fir is overtaking ponderosa pine in the warm-dry mixed conifer. Forest fire regimes have shifted from high-frequency, low-intensity surface fire to low-frequency, high-intensity stand-replacement fire.

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# **Appendix L**

# **Bureau of Land Management Grazing Allotment Status and Permitted Animal Unit Months**

# APPENDIX L: BUREAU OF LAND MANAGEMENT GRAZING ALLOTMENT STATUS AND PERMITTED ANIMAL UNIT MONTHS

Table L-1 identifies the management status, available animal unit months (AUMs), and other information for Bureau of Land Management (BLM) grazing allotments in the Tres Rios Field Office under Alternative B (Preferred Alternative). Any changes in permitted livestock use would be made following direction per regulations at 43 Code of Federal Regulations 4110.3

Allotment Name	Allotment Number	Allotment Status*	Management Category	Livestock Type	Grazing System	Season of Use	Season of Use (2)	Permitted Public AUMs
Beards Corner	17059	Active	Custodial	Cattle	Continuous	3/1 to 3/19		60
Buck Knob	17054	Active	Custodial	Cattle	Continuous	6/1 to 10/31		6
Bull Canyon	17053	Active	Improve	Cattle	Dormant season	11/19 to 2/28		503
Bull Lake	17058	Active	Custodial	Cattle	Continuous	6/1 to 10/31		25
Bush Canyon	17015	Active	Maintain	Cattle	Continuous	6/1 to 7/15	8/25 to 10/8	76
Chico Creek	08074	Active	Custodial	Cattle	Continuous	6/1 to 9/30		8
Coyote Park	08444	Active	Custodial	Cattle	Continuous	6/1 to 10/31		25
Deer Park	08907	Active	Maintain	Sheep	Rotation	7/16 to 8/13		243
Desert Claim	17049	Active	Custodial	Cattle	Rotation	5/1 to 12/10		200
Disappointment Creek	17036	Active	Improve	Cattle	Rotation	11/1 to 5/31		2,508
Dry Creek Basin	17016	Active	Improve	Cattle	Rotation	4/1 to 5/19	12/10 to 2/28	3,105
East Archuleta Mesa	08446	Active	Custodial	Cattle	Continuous	6/15 to 10/15		55
East Broad Canyon	08072	Active	Custodial	Cattle	Continuous	11/1 to 5/31		18
East Mud Creek	08008	Active	Custodial	Cattle	Continuous	11/10 to 11/21	5/10 to 5/28	12
East Pines Common	08005	Active	Maintain	Cattle	Rest-rotation	6/10 to 10/31		921
East Summit Mesa	17009	Active	Custodial	Cattle	Continuous	4/1 to 12/31		18
East Weber Mountain	08045	Active	Custodial	Cattle	Continuous	10/1 to 11/30	5/1 to 5/31	35
Egnar Mesa	17026	Active	Maintain	Cattle	Rotation	3/1 to 4/30	11/1 to 2/28	144
Elk Creek	08910	Active	Maintain	Sheep	Rotation	7/11 to 7/24		93
Elk Point	08004	Active	Custodial	Cattle	Continuous	6/1 to 9/1		23
Engine Creek/Deer Creek	13313	Active	Custodial	Sheep	Rotation			16
Eureka	08902	Active	Maintain	Sheep	Rotation	7/10 to 9/15		900
Flint Rock Point	08047	Active	Custodial	Cattle	Continuous	8/1 to 9/24		18
Florida River	08416	Active	Custodial	Cattle	Continuous	3/1 to 2/28		102
Gladstone	08901	Active	Maintain	Sheep	Rotation	7/10 to 9/5		358
Gyp Ridge	17006	Active	Improve	Cattle	Dormant season	12/1 to 2/28		315

Allotment Name	Allotment Number	Allotment Status*	Management Category	Livestock Type	Grazing System	Season of Use	Season of Use (2)	Permitted Public AUMs
Gypsum Gap	17002	Active	Improve	Cattle	Dormant season	12/15 to 2/24		398
Gypsum Valleys	08068	Active	Improve	Cattle	Rotation	11/1 to 5/31	_	1,807
Hopkins Draw	08408	Active	Custodial	Cattle	Continuous	6/10 to 10/15	_	39
Horse Park	17045	Active	Custodial	Cattle	Continuous	-	_	132
Indian Valley	17046	Active	Improve	Cattle	Rotation	11/1 to 2/28	3/1 to 5/31	1,114
Island Mesa	17025	Active	Custodial	Cattle	Continuous	-	_	1,910
Klondike	08458	Active	Custodial	Cattle	Continuous	5/1 to 9/26	_	24
Lavender Point	17064	Active	Custodial	Cattle	Continuous	6/1 to 10/31	_	20
Maggie Gulch	08911	Active	Maintain	Sheep	Rotation	7/1 to 9/15	_	433
Mahan	08401	Active	Maintain	Cattle	Continuous	6/1 to 9/30	_	162
Mancos	08031	Active	Custodial	Cattle	Continuous	6/1 to 7/31	_	20
Mancos Hill	08465	Active	Custodial	Cattle	Continuous	5/1 to 11/30	_	7
Mancos River	08042	Active	Custodial	Cattle	Continuous	5/1 to 5/12	11/10 to 11/22	46
Martinez	08060	Active	Custodial	Cattle	Continuous	6/1 to 9/30	_	12
McKenna Peak	17017	Active	Maintain	Cattle	Rotation	6/1 to 10/5	_	200
Mesa Pedregosa	08454	Active	Custodial	Cattle	Continuous	5/15 to 7/10	10/1 to 10/15	48
Mesa Verde	08053	Active	Maintain	Cattle	Continuous	12/1 to 5/31	_	200
Montezuma Creek	08075	Active	Custodial	Cattle	Continuous	6/1 to 9/30	_	8
Montoya Peak	08405	Active	Custodial	Cattle	Continuous	6/1 to 10/31	_	20
Mud Creek	08028	Active	Custodial	Cattle	Continuous	4/20 to 5/25	_	135
Mud Springs	08040	Active	Maintain	Cattle	Dormant season	11/7 to 12/6	_	50
Nash Cemetery	08020	Active	Improve	Cattle	Continuous	8/15 to 10/15	-	239
Nelson	17055	Active	Improve	Cattle	Continuous	10/10 to 11/15	4/10 to 5/25	324
North Cahone	08079	Active	Custodial	Cattle	Continuous	5/1 to 12/15	_	8
North Mancos	08030	Active	Custodial	Cattle	Continuous	9/1 to 9/30	_	48
North Menefee Mountain	08032	Active	Custodial	Cattle	Continuous	6/15 to 10/13	_	16
Picayne/Mineral Point	08903	Active	Maintain	Sheep	Rotation	7/10 to 9/15	_	463
Point Lookout	08054	Active	Maintain	Cattle	Continuous	5/1 to 6/1	12/1 to 2/28	45
RCA	17057	Active	Improve	Cattle	Rotation	1/9 to 5/15	_	1,217
Reservoir Canyon	08404	Active	Custodial	Cattle	Continuous	6/1 to 9/15	_	64
Rincone	17214	Active	Custodial	Cattle	Continuous	6/1 to 8/1	_	10
Roberts Canyon	08407	Active	Custodial	Cattle	Continuous	6/1 to 9/1	_	75
Salt Arroyo	17005	Active	Improve	Cattle	Continuous	11/15 to 2/15	_	153
San Juan River	08464	Active	Custodial	Horse	Continuous	6/1 to 10/15	_	5

Allotment Name	Allotment Number	Allotment Status*	Management Category	Livestock Type	Grazing System	Season of Use	Season of Use (2)	Permitted Public AUMs
Sandrock	08063	Active	Maintain	Cattle	Rotation	6/1 to 10/15	_	590
Sharps Draw	08006	Active	Custodial	Cattle	Continuous	5/1 to 11/1	-	24
Simon Draw	08016	Active	Custodial	Cattle	Continuous	12/1 to 12/30	-	8
Ski Lift	08406	Active	Custodial	Cattle	Continuous	5/15 to 11/1	-	11
Slick Rock	17034	Active	Improve	Cattle	Rotation	11/1 to 2/28	3/1 to 4/30	1,125
South Canby	08400	Active	Custodial	Cattle	Continuous	6/1 to 10/30	_	10
South Ice Plant	08056	Active	Custodial	Cattle	Continuous	5/21 to 6/5	-	1
South Mountain	17043	Active	Custodial	Cattle	Continuous	6/19 to 10/9	-	231
Spencer Lake	17104	Active	Custodial	Cattle	Continuous	6/16 to 10/31	ı	103
Spring Creek	17056	Active	Improve	Cattle	Dormant season	_	ı	318
Spud Patch	17038	Active	Maintain	Cattle	Rotation	5/16 to 11/14	-	878
Summer Camp	17226	Active	Custodial	Cattle	Rotation	6/15 to 10/20	ı	118
Summit Mesa	17007	Active	Custodial	Cattle	Continuous	4/1 to 12/31	ı	10
Summit Point	17019	Active	Custodial	Cattle	Continuous		_	50
Tater Mountain	08455	Active	Custodial	Cattle	Continuous	5/1 to 10/31	-	41
Taylor	07228	Active	Custodial	Cattle	Continuous	_	-	72
Upper Disappointment	17000	Active	Maintain	Cattle	Continuous	5/15 to 11/15	_	303
Vigil/Abeyta Mesas	08456	Active	Maintain	Cattle	Continuous	6/15 to 9/13	-	94
Wallace Pasture	08073	Active	Maintain	Cattle	Continuous	6/1 to 10/11	ı	148
Warden Draw	17028	Active	Improve	Cattle	Continuous	6/15 to 8/15	ı	40
West Cahone	08049	Active	Custodial	Cattle	Continuous	10/1 to 11/30	5/1 to 5/31	30
West Mesa Verde	08051	Active	Custodial	Cattle	Continuous	11/3 to 2/28	-	35
West Mud	08026	Active	Custodial	Cattle	Continuous	11/15 to 12/16	ı	8
West Osborne	17051	Active	Custodial	Cattle	Continuous	6/1 to 10/31	_	73
West Rabbit Mountain	08430	Active	Custodial	Cattle	Continuous	6/1 to 10/31	_	21
West Vosberg Pike	08415	Active	Custodial	Horse	Continuous	7/1 to 11/15	_	54
Big Canyon	08003	Vacant	Improve	Cattle	None	_	ı	0
Chromo Mtn	08452	Vacant	Maintain	Cattle	None	_	ı	0
Joes Canyon	08048	Vacant	Maintain	Cattle	None	-	_	0
La Mesa	08451	Vacant	Maintain	Cattle	None	_	_	0
Little Molas/West Needles	08906	Vacant	Maintain	Sheep	None	_	_	0
Minnie Gulch	08909	Vacant	Maintain	Sheep	None	_	Ī	0
Old Young	17041	Vacant	Improve	Cattle	None	_	_	0
Stinking Spring Canyon	08052	Vacant	Maintain	Cattle	None	_	_	0

Allotment Name	Allotment Number	Allotment Status*	Management Category	Livestock Type	Grazing System	Season of Use	Season of Use (2)	Permitted Public AUMs
Upper Vigil Mesa	08457	Active	Custodial	Cattle	None	_	-	0
Vigil Mesa	08463	Active	Custodial	Cattle	None	-	_	0
Wallace Gulch	08429	Vacant	Maintain	Cattle	None	-	_	0
Wildwater Canyon	08403	Vacant	Maintain	Cattle	None	_	_	0
Willow Creek	08034	Vacant	Improve	Cattle	None	_	_	0

<sup>\*</sup>Active = Available for grazing.

Vacant = Available for grazing, but the respective grazing allotment is not under permit.

# **Appendix M**

# Land and Resource Management Plan Components Related to Terrestrial Wildlife Species

# LAND AND RESOURCE MANAGEMENT PLAN COMPONENTS RELATED TO TERRESTRIAL WILDLIFE SPECIES

Highlight species is a concept that is utilized within the context of this planning process as a tool for the development of an ecosystem and diversity approach to planning within his document. They are utilized as a planning tool to this end and serve no further functionality past Land and Resource Management Plan (LRMP) development for which they were intended. Agencies have no further responsibility or obligation for action, intended or implied, other than those specifically stated in the LRMP.

Criteria that were developed for the selection of highlight species did include other classifications of species in which the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) have additional responsibilities. Examples of these categories include federally threatened and endangered species, along with BLM and USFS sensitive species. Obligations to these categories of species are described within the appropriate legislation, policy, and regulation concerning those categories and will be met under requirements of those specific programs and not under any perceived obligation as a highlight species.

San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO) highlight species were selected from the following categories:

- NatureServe Queried by G1-3, T1-3, N1&2, S1&2 species for each county in the planning area.
- USFS Region 2 Sensitive Species List for the SJNF.
- BLM State Sensitive Species List, queried for the TRFO.
- Colorado Parks and Wildlife list of endangered, threatened, and species of special concern.
- U.S. Fish and Wildlife Service Birds of Conservation Concern (BCC), queried by Bird Conservation Region 16.
- Federal proposed and candidate species, queried by the state of Colorado.
- BLM species of concern 1985 Resource Management Plan.
- USFS Management Indicator Species (MIS) for the SJNF.
- Hunted, fished, and public interest species.
- Recently federal delisted species for Colorado (American peregrine falcon, bald eagle).
- Petitioned for federal listing (currently, no outstanding petitions for SJNF or TRFO species).
- Other species of public interest.
- Additional species with local or regional conservation concern.

Table M.1 lists many of the LRMP components that support the ecological framework and management direction supporting species sustainability across the planning landscape. These may range from basic ecological needs providing for soil, water, air, forage, and prey species requirements, to management direction in differing program areas, as well as species specific direction. The components provide for needs not covered by other existing direction. The table does not list and repeat existing direction found in law, regulation, policy, and agreements that can be found under "Other Referenced Guidance" in each LRMP resource section.

Table M.1: Terrestrial Wildlife Highlight Species Plan Provisions

Species	Source/	Habitat	Applicable Plan Component				
	Rank		Root Number	Component	Component Number		
			Insects				
Nokomis fritillary butterfly aka. Great Basin	NatureServe G3 T1, BLM and USFS Sensitive	Riparian springs and seeps	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 16, 17, 18, 19, 23, 28, 29, 30, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42		
silverspot butterfly				Objectives	45, 52, 54, 56, 57, 58, 59, 62,		
(Speyeria nokomis				Standards	65		
nokomis)				Guidelines	69, 70, 73, 74, 75, 76, 79, 84, 85, 86		
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 10, 11, 12, 13, 14, 17, 18		
			_	Objectives	24, 25, 27, 29, 30		
				Standards	43		
				Guidelines	50, 57, 58		
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12,		
			Ecosystems	Objectives	15, 16, 18, 18,		
				Standards	19, 20, 21		
				Guidelines	22, 24, 25, 27, 28		
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 4		
			Fisheries	Objectives	15		
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13		
				Objectives	19, 22, 23		
				Standards	29, 30		
				Guidelines	32, 35, 36, 37, 38, 39, 40		
			2.7 Livestock and Rangeland	Desired Conditions	2,4		
			Management	Guidelines	15, 16, 17, 18, 19, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34,		
			2.8 Invasive Species	Desired Conditions	21, 2, 3, 4, 5		
			_	Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
					2.9 Timber and Other Forest Products	Objectives	5a
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			_	Objectives	6		
			2.11 Fire and Fuels Management	Desired Conditions	6, 7, 8		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	2,7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		

Species	Source/	Habitat	at Applicable Plan Component					
	Rank		Root Number	Component	Component Number			
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13			
			Management	Objectives	19			
				Standards	22			
				Guidelines	23, 24, 25,27			
			2.14 Recreation	Desired Conditions	1, 5, 11 20, 22, 25, 28			
				Objectives	49			
			2.15 Scenery and Visual Resource	Desired Conditions	2			
			Management	Objectives	19			
			2.18 Lands and Special Uses	Desired Conditions	3			
				Guidelines	13, 15, 16, 27, 30			
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5			
				Objectives	6			
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	3			
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4			
			Hazardous Materials	Objectives	7			
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9			
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 10, 12, 13, 15			
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 11			
			3.3 Columbine Geographic Area	Desired Conditions	1, 3, 4, 7, 8, 9, 10			
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1			
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1			
			3.16 Falls Creek Archeological Area	Desired Conditions	8			
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5			
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1			
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5			
					3.1, 3.6, 3.7, 3.8			
			3.23 Dolores River Canyon	Desired Conditions	1, 2			
				Objectives	6, 7, 8			
			3.25 HD Mountains Unique Landscape	Desired Conditions	8, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25			
			Landscape	Objectives	29, 30, 31, 32			

Species	Source/	Habitat	Applicable Plan Component				
	Rank		Root Number	Component	Component Number		
			3.27 Rico	Desired Conditions	10, 11, 12		
				Objectives	A, C, G		
			Appendix H Oil and Gas*		1, 2, 3, 4, 5, 6, 12		
11 \	NatureServe S2	Desert seeps and along	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 9, 11, 16, 17, 18, 30, 31, 32, 35,		
yuma)		streams with stands of	Plant Species		36, 37, 38, 39, 40, 41		
		foodplant.		Objectives	45, 59, 60, 62		
				Standards	65		
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86		
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 11, 12, 13		
				Objectives	24, 25, 30		
				Guidelines	57, 58		
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12		
			Ecosystems	Objectives	16, 17, 18		
				Standards	19, 20, 21		
				Guidelines	22, 24, 25, 26, 27, 28		
			2.5 Aquatic Ecosystems and Fisheries	Desired Conditions	1, 2, 3, 4		
				Standards	18		
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13		
				Objectives	19, 22, 23		
				Standards	29, 30		
				Guidelines	32, 35, 36, 37, 38, 39, 40		
			2.7 Livestock and Rangeland Management	Desired Conditions	4, 6, 7		
				Guidelines	22, 23, 28, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			2.11 Fire and Fuels Management	Desired Conditions	6,7		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	2,7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8		
			Management	Objectives	19		

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
				Standards	22
				Guidelines	23, 25
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	29
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 13
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1
			3.18 Spring Creek Wild Horse	Desired Conditions	5
			Herd Management Area	Desired Conditions	1.2
			3.23 Dolores River Canyon		1, 2 6, 7, 8
			Appendix H Oil and Gas*	Objectives	1, 2, 3, 4, 5, 6, 12, 38, 39, 40
			1 11		1, 2, 3, 4, 3, 0, 12, 38, 39, 40
	N. C. CATO LIGEO	D: ' ' D 1	Birds	Desired Conditions	1 2 2 4 5 6 0 11 12 15 16 17 19 10
American peregrine falcon (Falco peregrinus anatum)	NatureServe G4 T3, USFS and BLM Sensitive, BCC, Recently delisted, State		2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 15, 16, 17, 18, 19, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40
	special concern			Objectives	45, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62
				Standards	65
				Guidelines	69, 70, 73, 75, 76, 79, 80, 82, 83, 84, 85, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 17, 18
				Objectives	24, 25, 29, 30
				Standards	35, 44, 45, 46, 47, 48
				Guidelines	49, 50, 55, 58, 67, 68, 69, 70, 72, 73, 74, 75,
					76, 77, 78, 79
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 10, 11, 12
			Ecosystems	Objectives	13, 16, 17, 18

Species	Source/	Habitat	itat Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 4, 5, 6	
			Fisheries	Objectives	15	
				Standards	18	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13, 14	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1,3	
			Products	Objectives	5a, 5c	
				Standards	12, 16	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	

Species	Source/	Habitat	A	Applicable Plan Component		
	Rank		Root Number	Component	Component Number	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 6, 7, 8, 11, 12, 13, 14, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11	
			3.3 Columbine Geographic Area	Desired Conditions	1, 3, 4, 7, 8, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1,2	
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern	Guidelines	9	
			3.16 Falls Creek Archeological Area	Desired Conditions	8	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.21 Chattanooga Special Botanical	Desired Conditions	1, 3, 4, 5	
			Area	Standards	9	
			3.23 Dolores River Canyon	Desired Conditions	1, 2	
				Objectives	6, 7, 8	
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25	
				Objectives	29, 30, 31, 32	
			3.26 McPhee	Desired Conditions	2	
			3.27 Rico	Desired Conditions	10, 11	
			Appendix H. Oil and Gas*		1, 2, 3, 6, 7, 8, 9, 12, 28, 29, 37, 38, 39, 40	

Species	Source/	Habitat	Applicable Plan Component				
	Rank		Root Number	Component	Component Number		
American bald eagle (Haliaeetus leucocephalus)	Recently delisted, State	River, reservoir, and stream habitat	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 15, 16, 17, 18, 19, 22, 23, 24, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41		
	special concern			Objectives	45, 46, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62,		
				Standards	65		
				Guidelines	69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 82, 83, 84, 85, 86		
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 20, 22		
				Objectives	24. 25, 29, 30, 31, 33		
				Standards	35		
				Guidelines	49, 50, 58, 59, 60, 61, 62, 63, 66		
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12		
			Ecosystems	Objectives	13, 16, 17, 18		
				Standards	20, 21		
				Guidelines	22, 24, 25, 26, 27, 28		
			2.5 Aquatic Ecosystems and Fisheries	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13		
				Objectives	15, 16, 17		
				Standards	18a, 18d, 19		
				Guidelines	21, 22, 24		
			2.6 Water Resources	Desired Conditions	1, 2, 4, 6, 7, 8, 9, 12, 13, 14, 15		
				Objectives	19, 21, 22, 23		
				Standards	29, 30		
				Guidelines	32, 35, 36, 38, 39		
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 8		
			Management	Objectives	9, 14		
				Guidelines	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	13, 14, 15, 17, 18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4		
			Products	Objectives	5a, 5c, 11		
				Standards	12, 16, 18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4		
				Objectives	6		

Species	Source/		A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16, 17
			2.12 Air Quality	Desired Conditions	2
				Objectives	9, 10
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28, 29, 30, 31
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 35, 36, 37, 38
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3
			2.21. Abandoned Mine and	Desired Conditions	1,4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 10, 12, 13, 14, 15
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of	Desired Conditions	1
			Critical Environmental Concern	Guidelines	9
			3.16 Falls Creek Archeological Area	Desired Conditions	7,8

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
			3.18 Spring Creek Wild Horse	Desired Conditions	5
			Herd Management Area		
			3.19 Perins Peak Wildlife	Desired Conditions	1
			Management Area		
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6
			Draw Old Growth Recruitment Areas		8, 9, 10
			3.23 Dolores River Canyon	Desired Conditions	1
				Objectives	6,7,8
			3.24 Silverton	Desired Conditions	9, 10
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22,
			Landscape	Obiations	23, 24 28, 29, 30, 31, 32
			2.26 M-Di	Objectives Desired Conditions	
			3.26 McPhee 3.27 Rico	Desired Conditions  Desired Conditions	2 6, 7, 10, 11
			Appendix H. Oil and Gas*	Desired Conditions	
America Bittern	USFS sensitive, BCC	Marsh syramon an haa yyith	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 6, 12, 28, 29, 31, 32, 33, 39, 40 1, 2, 3, 4, 5, 6, 11, 16, 17, 18, 35, 36, 37, 38,
(Botaurus lentiginosus)		Marsh, swamp or bog, with cattails, rushes, grasses, and sedges		Desired Conditions	41,
				Objectives	45, 59, 62
				Standards	65
				Guidelines	69, 75, 76, 86
				Desired Conditions	1, 3, 4, 5, 10, 12, 14, 17, 18
				Objectives	24, 25, 30
				Guidelines	50, 55, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 6, 7, 9, 10, 11, 12
			Ecosystems	Objectives	15, 16, 17, 18
				Standards	19, 20, 21
				Guidelines	22, 24, 25, 26, 27, 28
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
			Fisheries	Objectives	15, 16, 17
				Standards	18a, 18b, 18c, 18d, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26, 27, 28
			2.6 Water Resources	Desired Conditions	1, 2, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15
				Objectives	19, 21, 22, 23
				Standards	29, 30
				Guidelines	32, 35, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	4
			Management	Guidelines	22, 23, 28, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
				Standards	10, 12	
				Guidelines	13, 14, 15, 16, 17, 18	
			2.9 Timber and Other Forest Products	Standards	16	
			2.10. Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
				Objectives	9	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource Management	Desired Conditions	2, 19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
			2.21 Abandoned Mine and	Desired Conditions	1,4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 12, 13	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 8, 9	
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	

Species	Source/	Habitat		mponent	
	Rank		Root Number	Component	Component Number
			3.16 Falls Creek Archeological	Desired Conditions	8
			Area		
			3.23 Dolores River Canyon	Desired Conditions	1, 2
				Objectives	6, 7, 8
			3.25 HD Mountains Unique	Desired Conditions	8, 14, 17, 18, 23
			Landscape	Objectives	29, 30
			3.27 Rico	Desired Conditions	10, 11, 12
			Appendix H. Oil and Gas*		1, 2, 3, 6, 28, 37, 38, 39, 40
Black swift (Cypseloides	BCC, BLM and USFS	Riparian, Cliff rock	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 8, 9, 15, 16, 17, 18, 19, 21, 25,
niger)	Sensitive		Plant Species		26, 27, 33, 34, 35, 36, 37, 38, 39, 41
				Objectives	45, 48, 49, 50, 51, 57, 58, 59, 60, 61, 62, 63,
					64
				Standards	65
				Guidelines	69, 70, 74, 76, 77, 78, 82, 83, 84, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 10, 12, 13, 14, 17, 18
				Objectives	24, 25, 30
				Guidelines	50, 55, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12
			Ecosystems	Objectives	13, 15, 17
				Standards	19, 20, 21
				Guidelines	22, 24, 25, 26, 27, 28
			2.5 Aquatic Ecosystems and Fisheries	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8
				Objectives	15
				Standards	18a, 18b, 18c, 18d
				Guidelines	24, 26
			2.6 Water Resources	Desired Conditions	1, 2, 7, 8, 9, 11, 12, 13, 14, 15
				Objectives	19, 21, 22, 23
				Standards	29, 30
				Guidelines	32, 35, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6
			Management	Guidelines	28, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9
				Standards	10, 12, 18
			2.9 Timber and Other Forest	Desired Conditions	1,4
			Products	Objectives	11
				Standards	16
				Guidelines	18
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4

Species	Source/		A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7
				Objectives	12
				Standards	13, 14
				Guidelines	15, 16, 17
			2.12 Air Quality	Desired Conditions	1, 2, 7
				Objectives	8
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 38
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3, 4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	2, 3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	1,4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1,2
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.24 Silverton	Desired Conditions	4, 9, 10
			3.27 Rico	Desired Conditions	10, 11, 12
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 8, 9, 28, 37, 40

Species	Source/	Habitat	Applicable Plan Component					
	Rank		Root Number	Component	Component Number			
Columbian (mountain)		Mountain shrublands	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 28,			
sharp-tailed grouse	game sps., BLM Sensitive,		Plant Species		29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40			
(Tympanuchus	State special concern,			Objectives	45, 56, 57, 58, 59, 60, 62			
phasianellus	USFS sensitive species but			Standards	65			
columbianus)	does not occur on SJNF			Guidelines	69, 70, 73, 75, 76, 79, 80, 84, 86			
	lands		2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 6, 10, 11, 12, 14, 17, 18			
				Objectives	24, 25, 29, 30			
				Standards	44			
				Guidelines	58, 67, 68, 69			
			2.4. Riparian Area and Wetland	Desired Conditions	11			
			Ecosystems	Objectives	17, 18			
				Guidelines	27			
			2.6 Water Resources	Desired Conditions	6, 9, 11, 12			
				Objectives	18, 22, 23			
				Standards	29			
				Guidelines	32, 35, 36, 37, 38, 39			
						2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7
			Management  2.8 Invasive Species	Objectives	9			
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30,			
					32, 33, 34			
				Desired Conditions	1, 2, 3, 4, 5			
				Objectives	6, 7, 8, 9			
				Standards	10, 12			
				Guidelines	18			
			2.10 Insects and Disease	Desired Conditions	1,2			
			2.11 Fire and Fuels Management	Desired Conditions	3, 4, 6, 7			
				Objectives	11, 12			
				Standards	13, 14			
				Guidelines	15, 16			
			2.12 Air Quality	Desired Conditions	2,7			
				Objectives	8			
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20			
				Guidelines	21, 22, 23, 24, 25, 26			
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13			
			Management	Objectives	19			
				Standards	22			
				Guidelines	23, 24, 27, 28			
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28			
				Objectives	59			

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
			_	Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 6, 7, 8, 11	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6,8	
			Appendix H. Oil and Gas*	-	10, 11, 25, 26, 27, 38	
Ferruginous Hawk (Bueto regalis)	BLM and USFS sensitive, BCC	Winter migrant only; grasslands and semi-desert	Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 16, 17, 18, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40	
-		shrub		Objectives	45, 56, 57, 58, 59, 60, 62	
				Standards	65	
				Guidelines	69, 70, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 8, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	49, 55, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	12	
			Ecosystems	Objectives	18	
				Guidelines	27	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Standards	29	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	

Species	Source/ Habitat	A	pplicable Plan Co	mponent	
	Rank		Root Number	Component	Component Number
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30,
					32, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	18
			2.10 Insects and Disease	Desired Conditions	1, 2, 3
			2.11 Fire and Fuels Management	Desired Conditions	6, 7
				Objectives	11, 12
				Standards	13, 14
				Guidelines	16
			2.12 Air Quality	Desired Conditions	2,7
				Objectives	8
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 34, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	1, 2, 4, 7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 11
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1,9

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area			
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 8	
			Appendix H. Oil and Gas*		28, 29, 30, 38	
Gunnison sage grouse (Centrocercus minimus)	NatureServe G1, Federal Proposed Endangered with	Sagebrush shrublands	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 30, 31, 32, 35, 36, 37, 38, 39, 40	
	Proposed Critical Habitat,			Objectives	45, 56, 57, 58, 60, 62	
	BCC, State special			Standards	65	
	concern			Guidelines	69, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 26, 29, 30	
				Standards	45, 46, 47, 48	
				Guidelines	50, 58, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79	
			2.4 Riparian Area and Wetland	Desired Conditions	11, 12	
			Ecosystems	Objectives	17, 18	
			2.6 Water Resources	Desired Conditions	9, 10, 11, 12	
				Objectives	22, 23	
				Standards	29	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland Management	Desired Conditions	2, 4, 5, 7	
				Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 4	
			•	Objectives	6, 7, 8, 9	
				Standards	10, 11, 12	
				Guidelines	18	
			2.10. Insects and Disease	Desired Conditions	1, 2, 3, 4	
			2.11 Fire and Fuels Management	Desired Conditions	6,7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Objectives	8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.13 Access and Travel	Desired Conditions	1, 2, 8	
			Management	Objectives	19, 22	
				Guidelines	23, 24, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2, 19	
			Management			
			2.18 Lands and Special Uses	Desired Conditions	3, 4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	1, 2, 3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 6, 7, 8, 11	
			Geographic Area			
			3.2 Dolores Ranger District	Desired Conditions	1	
			Geographic Area	D : 10 I':	1	
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.23 Dolores River Canyon	Desired Conditions	2	
			b.25 Boiotes raver emilyon	Objectives	6	
			Appendix H. Oil and Gas*	- Cojecu ves	10, 11, 20, 21, 22, 23, 24	
Golden eagle (Aquila chrysaetos)	BCC	Pinyon-juniper, Sagebrush shrublands, Grasslands, Agricultural, Cliff rock	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41	
				Objectives	45, 52, 54, 55, 56, 57, 58, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	
				Objectives	24, 25, 30, 31, 33	
				Standards	35, 39, 40, 41, 42, 44, 45, 46, 47, 48	
				Guidelines	58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79	

Species	Source/	Habitat	A	Applicable Plan Component			
	Rank		Root Number	Component	Component Number		
			2.4 Riparian Area and Wetland	Desired Conditions	1		
			Ecosystems	Objectives	17, 18		
				Guidelines	27		
			2.6 Water Resources	Desired Conditions	4, 9, 11, 12, 22, 23		
				Standards	29		
				Guidelines	32, 35, 36, 37, 38, 39		
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 7, 8		
			Management	Objectives	9		
				Standards	11, 12, 14		
				Guidelines	15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
			-	Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4		
			Products	Objectives	5a, 11		
				Standards	12, 16		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4		
				Objectives	6		
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16		
			2.12 Air Quality	Desired Conditions	2,7		
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 25, 27, 28, 29, 30, 31		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 37, 38		
				Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		
			2.18 Lands and Special Uses	Desired Conditions	3, 4		
			_	Guidelines	13, 15, 18, 27, 30		

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	1, 2, 3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 3, 7, 8, 10, 11, 15
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 11
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1,9
			3.16 Falls Creek Archeological Area	Desired Conditions	7,8
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6
			Draw Old Growth Recruitment Areas	Objectives	8, 9, 10
			3.23 Dolores River Canyon	Desired Conditions	1
			_	Objectives	6, 7, 8
			3.25 HD Mountains Unique	Desired Conditions	11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25
			Landscape	Objectives	28, 29, 30, 31, 32
			3.26 McPhee	Desired Conditions	2
			3.27 Rico	Desired Conditions	6
			Appendix H. Oil and Gas*		1, 8, 9, 10, 11, 12, 28, 29, 30, 31, 32, 33, 34, 37, 38, 39, 40

Species	Source/	Habitat	A	Applicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
Northern goshawk (Accipiter gentiles)	USFS and BLM Sensitive	Aspen, Ponderosa pine, Mixed conifer	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 29, 30, 33, 35, 36, 37, 38, 39, 41
				Objectives	45, 46, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62
				Standards	65
				Guidelines	69, 70, 74, 76, 78, 82, 83, 84, 85, 86,
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13 14, 17, 18, 20, 23
				Objectives	24, 25, 29, 30, 31, 34
				Guidelines	49, 50, 55, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12
			Ecosystems	Objectives	17
				Standards	20
				Guidelines	22, 24, 25, 27, 28
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4
			Fisheries	Objectives	15
			2.6 Water Resources	Desired Conditions	8, 9, 10, 11, 12, 13
				Objectives	19, 21, 22, 23
				Standards	29
				Guidelines	32, 35, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6, 8
			Management	Objectives	9
				Standards	14
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	18
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4
			Products	Objectives	5a, 5c, 11
				Standards	12, 16
				Guidelines	18
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4
				Objectives	5,6
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16, 17

	Habitat	A	mponent	
Rank		Root Number	Component	Component Number
		2.12 Air Quality	Desired Conditions	1, 2, 7
			Objectives	8
			Standards	11, 12, 13, 14, 15, 16, 17, 18, 19 20
			Guidelines	21, 22, 23, 24, 25, 26
		2.13 Access and Travel	Desired Conditions	1, 2, 8, 13
		Management	Objectives	19
			Standards	22
			Guidelines	23, 24, 25, 27, 28
		2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
			Objectives	59
		2.15 Scenery and Visual Resource	Desired Conditions	2
		Management	Guidelines	19
		2.18 Lands and Special Uses	Desired Conditions	3,4
			Guidelines	13, 15, 16, 24, 27, 30
		2.19 Minerals and Energy	Desired Conditions	3, 4, 5
			Objectives	6
		2.20 Alternative Energy:	Desired Conditions	1, 2, 3
		Geothermal, Wind, Solar, Biomass 2.21 Abandoned Mine and	Di1 C1':	1.2.4
		Hazardous Materials	Desired Conditions Objectives	1, 2, 4
		2.22 Interpretation and	Desired Conditions	1 2 6 9 0
		Conservation Education		1, 3, 6, 8, 9
		3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 10, 13, 14, 15
		3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11
		3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9, 10
		3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
		3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1
		3.12 Research Natural Areas	Desired Conditions	1, 2, 3
		3.16 Falls Creek Archeological	Desired Conditions	8
		Area	Desired Conditions	o
		3.19. Perins Peak Wildlife	Desired Conditions	1
		Management Area	Desired Conditions	1
		3.21 Chattanooga Special Botanical	Desired Conditions	2, 3, 4, 5
		Area	Standards	9
		3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6
		Draw Old Growth Recruitment Areas		8,9,10

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	
			3.24 Silverton	Desired Conditions	4,9	
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 8, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			•	Objectives	29, 30, 31, 32	
			3.27 Rico	Desired Conditions	10	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 7, 8, 9, 12, 13, 28, 29, 30, 37, 40	
Northern harrier (Circus cyaneus)	BCC, USFS Sensitive	Riparian, Sagebrush shrublands, Wetlands,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41	
•		Grasslands, Agricultural	•	Objectives	45, 46, 56, 57, 58, 59, 60, 62	
				Standards	65	
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13	
				Objectives	24, 25, 30	
				Guidelines	49, 55, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 7, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 15, 16, 17, 18	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13, 14, 15	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
			•	Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6,7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	

Species	Source/	Source/ Habitat Rank	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22, 23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
			_	Guidelines	13, 15, 16, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
			-	Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 11, 12, 13	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 8, 9	
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern	Guidelines	9	
			3.16 Falls Creek Archeological Area	Desired Conditions	8	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.21 Chattanooga Special Botanical		3, 4, 5	
			Area	Standards	9	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	
			3.25 HD Mountains Unique	Desired Conditions	4, 8, 11, 15, 16, 17, 18, 19, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			3.27 Rico	Desired Conditions	10	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 10, 11, 12, 28, 29, 30, 37, 38,	
					39, 40	
Olive-sided flycatcher	USFS Sensitive	Riparian, Mixed conifer,	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 15, 17, 18, 19, 21,	
(Contopus borealis)		Spruce fir	Plant Species		22, 23, 24, 25, 26, 27, 35, 36, 37, 38, 39, 41	
				Objectives	45, 48, 49, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 74, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	49, 55, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11	
			Ecosystems	Objectives	13, 17, 18	
				Standards	20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 3, 4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4	
			Management	Guidelines	22, 23, 28, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 5c, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5,6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9	
				Objectives	11, 12	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Objectives	8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4, 5	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 10, 12, 13, 14, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.21 Chattanooga Special Botanical	Desired Conditions	3, 4, 5	
			Area	Standards	9	
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6	
			Draw Old Growth Recruitment Areas		8, 9, 10	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	
			3.24 Silverton	Desired Conditions	4, 9, 10	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			3.27 Rico	Desired Conditions	7, 10, 11, 12	
			Appendix H. Oil and Gas*		1, 2, 3, 6, 12, 13, 28, 37, 38, 39, 40	
Short-eared owl (Asio flammeus)	NatureServe G5 S2,USFS sensitive, PIF	Open habitats including grasslands, marsh edges,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41	
		shrub-steppe, and		Objectives	45, 56, 57, 58, 59, 60, 62	
		agricultural lands; requires		Standards	65	
		taller grass cover than		Guidelines	69, 73, 75, 76, 79, 84, 86	
		Northern harrier.	2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	49, 50, 55, 58	
			2.4 Riparian Area and Wetland Ecosystems	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	
				Objectives	13, 16, 17, 18	
				Standards	20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	2,4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6,7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	

Species	Source/	Source/ Habitat Rank	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.12 Air Quality	Desired Conditions	2,7	
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21. Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 13	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 9	
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
				Objectives	7 7 -	
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern	Guidelines	9	
			3.16 Falls Creek Archeological Area	Desired Conditions	8	
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area 3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area 3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23,	
			Landscape		24, 25	
				Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		1, 2, 3, 10, 11, 12, 28, 29, 30, 39	
Western burrowing owl (Athene cunicularia)	BLM and USFS sensitive, State threatened, BCC	Prairie dog colonies with vacant burrows; grasslands,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40	
		shrublands, deserts.		Objectives	45, 56, 57, 58, 59 62	
				Standards	65	
				Guidelines	69, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	49, 50, 55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland Management	Desired Conditions	2, 4, 5, 6, 7	
				Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10. Insects and Disease	Desired Conditions	1, 2, 3, 4	
			2.11 Fire and Fuels Management	Desired Conditions	6	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Objectives	8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5,11, 20, 22, 25, 28	
			_	Objectives	59	

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	8, 11
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of	Desired Conditions	1
			Critical Environmental Concern	Guidelines	9
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5
			Appendix H. Oil and Gas*		10, 11, 28, 29, 30, 34, 38
Western yellow-billed cuckoo (Coccyzus	Fed Candidate, USFS and BLM Sensitive, BCC,	Riparian, gallery cottonwoods with dense	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 15, 16, 17, 18, 19, 35, 36, 37, 38, 39, 40
americanus)	State special concern	willow understory.		Objectives	45, 59, 60, 61, 62
				Standards	65
				Guidelines	69, 75, 76, 84, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13, 14, 17, 18
				Objectives	24, 25, 29, 30
				Standards	50, 55, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12,
			Ecosystems	Objectives	16, 17, 18
				Standards	20, 21
				Guidelines	22, 24, 25, 26, 27, 28
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 5
			Fisheries	Objectives	15
				Standards	18, 18a, 18b, 18c, 18d

Species	Source/	Habitat	A	Applicable Plan Component			
	Rank		Root Number	Component	Component Number		
			2.6 Water Resources	Desired Conditions	2, 6, 7, 8, 9, 11, 12, 13, 14		
				Objectives	18, 21, 22, 23		
				Standards	29, 30		
				Guidelines	32, 35, 36, 37, 38, 39		
			2.7 Livestock and Rangeland	Desired Conditions	4,5		
			Management	Objectives	9		
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest Products	Desired Conditions	1,4		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			2.11 Fire and Fuels Management	Desired Conditions	1, 6, 7		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	2,7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 6, 13		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 25, 27, 28		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28		
				Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		
			2.18 Lands and Special Uses	Desired Conditions	3,4		
				Guidelines	13, 15, 16, 24, 27, 30		
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5		
				Objectives	6		
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4		
			Hazardous Materials	Objectives	7		

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1, 2, 12
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1, 2, 8
			Geographic Area	D : 10 E:	4.10
			3.3 Columbine Geographic Area	Desired Conditions	4, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5
			3.23 Dolores River Canyon	Desired Conditions	1,2
			_ ,	Objectives	6, 7, 8
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 8, 11, 15, 16, 17, 18, 19, 21, 22, 23, 25
			Landscape	Objectives	29, 30, 31, 32
			Appendix H. Oil and Gas*	j	1, 2, 3, 28, 38, 39
White-faced ibis (Plegadis chihi)	NatureServe G5 S2, BLM sensitive	Spring/fall migrant only; wet meadows, marsh edges,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 16, 17, 18, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41
(1 regues essen)		and reservoir shorelines.		Objectives	45, 56, 57, 58, 59 62
				Standards	65
				Guidelines	69, 75, 76, 79, 84, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13, 14, 17, 18
			_	Objectives	24, 25, 29, 30
				Guidelines	55, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 4, 5, 6, 9, 10, 11, 12
			Ecosystems	Objectives	16, 17, 18
				Standards	20, 21
				Guidelines	22, 24, 26, 27, 28
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4
			Fisheries	Objectives	15
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13
				Objectives	19, 21, 22, 23
				Standards	29, 30
				Guidelines	32, 35, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7
			Management	Objectives	9
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27,
					28, 29, 30, 32, 33, 34

Species	Species Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	24, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
			_	Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	5	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8, 13	
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.23 Dolores River Canyon	Desired Conditions	1, 2, 7, 8	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 28, 38, 39	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
White-tailed ptarmigan	USFS Sensitive, State	Alpine tundra and sub-	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 16, 17, 18, 34, 35, 36, 37,	
(Lagopus leucurus)	game sps., PIF	alpine riparian.	Plant Species		38, 39, 41	
				Objectives	45, 59, 62, 63, 64	
				Standards	65	
				Guidelines	69, 76, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13, 14, 16, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 56, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 15, 17	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	2, 4	
			Fisheries	Objectives	15	
				Standards	18	
				Guidelines	24	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 33, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
				Objectives	6	
			2.11 Fire and Fuels Management	Desired Conditions	6, 7, 9	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
			·	Objectives	8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	

Species	Source/	Habitat	at Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 37, 38	
				Objectives	59	
			2.15 Scenery and Visual Resource Management	Desired Conditions	2, 19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.3 Columbine Geographic Area	Desired Conditions	8	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.21 Chattanooga Special Botanical	Desired Conditions	3, 4, 5	
			Area	Standards	9	
			Appendix H. Oil and Gas*		2, 3, 4, 5, 40	
			Mammals			
Abert's squirrel (Sciurus aberti)	State game sps., MIS	Ponderosa pine	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 15, 17, 18, 19, 22, 23, 35, 36, 37, 38, 39	
				Objectives	45, 52, 54, 55, 59, 61, 62	
				Standards	65	
				Guidelines	69, 70, 73, 74, 76, 77, 78, 83, 84, 85	

Species	Source/	Habitat	tat Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 7, 10, 11, 12, 19, 20	
				Objectives	24, 25, 30, 31	
				Guidelines	58	
			2.6 Water Resources	Desired Conditions	9, 11, 12	
				Objectives	22, 23	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4,8	
			Management	Guidelines	33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
				Objectives	6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 8, 13, 19	
			Management	Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
			_	Guidelines	13, 15, 16, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials			
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 10, 15	
			Geographic Area			
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 7, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
				Objectives	1	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.22. Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5, 6	
			Draw Old Growth Recruitment Areas	Objectives	8, 9, 10	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		7, 8, 9, 12, 13, 37, 38, 40	
Botta's pocket gopher (Thomomys bottae)	NatureServe G5 T3, State special concern	Pinyon-juniper, Agricultural, Mountain shrublands, Semi-desert	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 13, 14, 16, 17, 18, 19, 22, 23, 24, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40	
		shrublands, Ponderosa pine, Open mixed conifer, Open		Objectives	45, 46, 49, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62	
		parklands		Standards	65	
				Guidelines	69, 74, 76, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12	
				Objectives	24, 25, 30	
				Guidelines	58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7, 8	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	18
			2.9 Timber and Other Forest Products	Desired Conditions	1, 5a
			2.10 Insects and Disease	Desired Conditions	1, 2, 3
				Objectives	6
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8
			ſ	Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16
			2.12 Air Quality	Desired Conditions	2,7
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13
			Management	Objectives	19
			-	Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
			_	Guidelines	13, 15, 16, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 10, 15
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 7, 11
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.6 Wilderness Areas and	Desired Conditions	1	
			Wilderness Study Areas			
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6	
			Draw Old Growth Recruitment Areas		8, 10	
			3.25 HD Mountains Unique	Desired Conditions	3, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		1, 2, 37, 38, 40	
Elk (Cervus elaphus)	State game sps., MIS		2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17,	
		elevation winter range	Plant Species		18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,	
				011	31, 32, 33, 34, 35,36, 37, 38, 39, 40, 41	
				Objectives	45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61	
				Standards	65, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 82,	
					83, 84, 85, 86	
				Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 19, 22	
				Objectives	24, 25, 30, 33	
				Guidelines	58, 59, 60, 61, 62, 63, 66	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	20, 21, 22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	2, 3,4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7, 8	
			Management	Objectives	9	
				Standards	14	
				Guidelines	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,	
					27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	

Species	Species Source/ Rank		Habitat	Applicable Plan Component			
			Root Number	Component	Component Number		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4		
			Products	Objectives	5a, 5c, 11		
				Standards	12, 16		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4		
				Objectives	5, 6		
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	1, 2, 7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 25, 27, 28, 29, 30, 31,		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 38		
				Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		
			2.18 Lands and Special Uses	Desired Conditions	3, 4		
				Guidelines	13, 15, 16, 27, 30		
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5		
				Objectives	6		
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4		
			Hazardous Materials	Objectives	7		
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9		
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 8, 10, 11, 12, 13, 14, 15		
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11		
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9, 10		
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1		

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			3.6 Wilderness Areas and	Desired Conditions	1
			Wilderness Study Areas		
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of	Desired Conditions	1
			Critical Environmental Concern		
			3.16 Falls Creek Archeological	Desired Conditions	6, 8
			Area		
			3.18 Spring Creek Wild Horse	Desired Conditions	5
			Herd Management Area		
			3.19 Perins Peak Wildlife	Desired Conditions	1
			Management Area	5 1 10 11	1015
			3.21 Chattanooga Special Botanical		1, 3, 4, 5
			Area	Standards	9
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6
			Draw Old Growth Recruitment Areas	, J	8, 9, 10
			3.23 Dolores River Canyon	Desired Conditions	1,2
				Objectives	6, 7, 8
			3.24 Silverton	Desired Conditions	4, 9, 10
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 8, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25
			•	Objectives	28, 30
			3.26 McPhee	Desired Conditions	2
			3.27 Rico	Desired Conditions	6, 7, 10, 11
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 31, 32, 33, 37, 38, 39, 40
Gunnison's prairie dog (Cynomys gunnisoni)	BLM and USFS Sensitive, State game sps.	Grasslands, Mountain shrublands, Sagebrush	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 19, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40
(Cynomys guinnsom)	State game sps.	shrublands, Semi-desert	Train species	Objectives	45, 56, 57, 58, 59, 62
		shrublands		Standards	65
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 14, 17, 18
			2.5 Terresular Vilame	Objectives	24, 25, 30
				Guidelines	50, 58
			2.6 Water Resources	Desired Conditions	12, 22, 23
				Guidelines	32, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7
			Management	Objectives	9
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30,
				Guidellies	32, 33, 34

Species	Species Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13, 19	
			Management	Standards	22	
				Guidelines	24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3, 4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 8, 11	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1	

Species	Source/		Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area			
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		1, 11, 12, 34, 37, 38	
Mule deer (Odocoileus	State game sps.		2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17,	
hemionus)		elevation winter range	Plant Species		18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,	
				01: 4:	31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57,	
				Objectives	43, 40, 48, 49, 50, 51, 32, 33, 34, 33, 30, 57, 58, 59, 60, 61	
				Standards	65, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 82,	
				Standards	83, 84, 85, 86,	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 19, 22	
			_ remegation (vinding	Objectives	24, 25, 30, 33	
				Guidelines	58, 59, 60, 61, 62, 63, 66	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	20, 21, 22, 23, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	2, 3, 4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7, 8	
			Management	Objectives	9	
				Standards	14	
				Guidelines	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
			_	Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 5c, 11	
				Standards	12, 16	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	5, 6	

Species	Species Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28, 29, 30, 31	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 38	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21. Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 8, 10, 11, 12, 13, 14, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 10, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1	
			3.16 Falls Creek Archeological Area	Desired Conditions	6,8	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area			
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.21 Chattanooga Special Botanical		1, 3, 4, 5, 6	
			Area	Standards	9	
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6	
			Draw Old Growth Recruitment Areas		8, 9, 10	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	
			3.24 Silverton	Desired Conditions	4, 9, 10	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 8, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23,	
			Landscape	011	25	
				Objectives	28,30	
			3.26 McPhee	Desired Conditions	2	
			3.27 Rico	Desired Conditions	6, 7, 10, 11	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 31, 32, 33,	
					37, 38, 39, 40	
New Mexico meadow jumping mouse (Zapus	NatureServe G5 T2 S1, Federal candidate, BLM	date, BLM riparian habitat	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 16, 17, 18, 19, 35, 36, 37, 38, 39, 41	
hudsonius luteus)	and USFS sensitive			Objectives	45, 57, 58, 59, 62	
				Standards	26	
				Guidelines	69, 76, 84, 86	
				Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	20, 21	
				Guidelines	22, 24, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4	
			Fisheries	Objectives	15, 18	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	5,6	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 32, 34	

Species	Source/	Habitat	A	mponent	
	Rank		Root Number	Component	Component Number
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
				Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	18
			2.10 Insects and Disease	Desired Conditions	1, 2, 3
			2.11 Fire and Fuels Management	Desired Conditions	6,7
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16, 17
			2.12 Air Quality	Desired Conditions	2,7
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1,2
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1,2
			3.3 Columbine Geographic Area	Desired Conditions	4, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			5.12 Research I valurar Areas	Desired Conditions	1, 4, 3

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.16 Falls Creek Archeological	Desired Conditions	8	
			Area			
			3.23 Dolores River Canyon	Desired Conditions	1, 2	
				Objectives	6, 7, 8	
			3.25 HD Mountains Unique	Desired Conditions	8, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 12, 37, 39, 40	
River otter (Lutra	State Threatened, USFS	Large water courses with	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 35, 36, 37, 38, 39	
Canadensis)	Sensitive	fish	Plant Species	Objectives	45, 59, 62	
				Standards	65	
				Guidelines	69, 76, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 11, 12, 13, 14, 17, 18	
				Objectives	25, 30	
				Guidelines	50, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	
			Fisheries	Objectives	15, 16, 17	
				Standards	18, 19	
				Guidelines	21, 22, 24	
			2.6 Water Resources	Desired Conditions	1, 2, 4, 6, 7, 8, 9, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	16, 17, 18, 19, 22, 23, 24, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	13, 14, 15, 16, 17, 18	
			2.9 Timber and Other Forest	Desired Conditions	1	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11. Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	

Species	Source/	Applicable Plan Component			
	Rank	Root Number	Component	Component Number	
			Standards	13, 14	
			Guidelines	15, 16, 17	
		2.12 Air Quality	Desired Conditions	1, 2, 7	
		·	Objectives	8, 9, 10	
			Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
			Guidelines	21, 22, 23, 24, 25, 26	
		2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
		Management	Objectives	19	
			Standards	22	
			Guidelines	23, 24, 25, 27, 28	
		2.14. Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
			Objectives	59	
		2.15 Scenery and Visual Resource	Desired Conditions	2	
		Management	Guidelines	19	
		2.18 Lands and Special Uses	Desired Conditions	3,4	
		_ `	Guidelines	13, 15, 16, 24, 27, 30	
		2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
			Objectives	6	
		2.20 Alternative Energy:	Desired Conditions	2	
		Geothermal, Wind, Solar, Biomass			
		2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
		Hazardous Materials	Objectives	7	
		2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
		3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 12, 13	
		3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 8, 9	
		3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8	
		3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
		3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
		3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
		3.23 Dolores River Canyon	Desired Conditions	1, 2	
			Objectives	6, 7, 8	
		3.24 Silverton	Desired Conditions	10	
		3.25 HD Mountains Unique	Desired Conditions	3, 8, 14, 15, 16, 17, 21, 23	
		Landscape	Objectives	29, 30, 31, 32	

Species	Source/ Rank		Applicable Plan Component			
			Root Number	Component	Component Number	
			3.27 Rico	Desired Conditions	10, 11, 12	
			Appendix H. Oil and Gas*		1, 2, 3, 6, 12, 37, 39, 40	
North American beaver (Castor canadensis)	State Small Game Species	Riparian, Aquatic	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 8, 9, 15, 16, 17, 18, 19, 21, 27, 35, 36, 37, 38, 39, 41	
			_	Objectives	45, 50, 51, 59, 61	
				Standards	65	
				Guidelines	69, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13	
				Objectives	24, 25, 30	
				Guidelines	58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 15, 16, 17, 18	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9	
			Fisheries	Objectives	16	
				Standards	18	
			2.6 Water Resources	Desired Conditions	4, 6, 7, 8, 9, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4, 5c, 11	
			Products	Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	2, 3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 2, 12, 13, 14	
			Geographic Area			
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 8, 9, 10	
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9	
			3.4 Pagosa Ranger District	Desired Conditions	1	
			Geographic Area	Desired Conditions		
			3.6 Wilderness Areas and	Desired Conditions	1	
			Wilderness Study Areas			
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.23 Dolores River Canyon	Desired Conditions	1, 2	
				Objectives	6, 7, 8	
			3.24 Silverton	Desired Conditions	4, 9, 10	
			3.27 Rico	Desired Conditions	10, 11, 12	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 12, 39, 40	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			Amphibian Group			
Canyon treefrog (Hyla	BLM Sensitive,	Riparian, Wetlands	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 11, 16, 35, 36, 37, 38, 39, 41	
arenicolor)	NatureServe S2 N5		Plant Species	Objectives	45, 59, 62	
				Standards	65	
				Guidelines	69, 73, 76	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 11, 12, 13, 14, 17, 18	
				Objectives	25, 29, 30	
				Guidelines	50, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9	
			Fisheries	Objectives	15, 16	
			Standards	18, 20		
				Guidelines	22, 23, 24, 25, 26, 28	
			2.6 Water Resources	Desired Conditions	1, 2, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	5, 6	
			Management	Objectives	9	
				Guidelines	16, 17, 22, 23, 24, 28, 32, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	14, 15, 17, 18	
			2.9 Timber and Other Forest	Desired Conditions	1	
			Products			
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2, 7	
				Objectives	9	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 12, 13	
			3.23 Dolores River Canyon	Desired Conditions	1, 2	
				Objectives	6, 7, 8	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 39	
Northern leopard frog	BLM and USFS Sensitive,	Riparian, wetlands	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 16, 19, 35, 36, 37, 38, 39, 41	
(Rana pipiens)	State special concern		Plant Species	Objectives	45, 59, 62	
				Standards	65	
				Guidelines	69, 76, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 25, 30	
				Guidelines	50, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 15, 16, 17, 18	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 6, 7, 8, 9	
			Fisheries	Objectives	15, 16	
				Standards	18, 20	
				Guidelines	22, 23, 24, 25, 26, 28	

Species	Source/	Habitat	A	Applicable Plan Component		
	Rank		Root Number	Component	Component Number	
			2.6 Water Resources	Desired Conditions	1, 2, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	5	
			Management	Objectives	9	
				Guidelines	16, 17, 21, 22, 23, 24, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	13, 14, 15, 17, 18	
			2.9 Timber and Other Forest	Desired Conditions	1	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Objectives	8, 9, 10	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3, 4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
1			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4	
			Hazardous Materials	Objectives	7	

Species	Source/	Habitat	mponent		
	Rank		Root Number	Component	Component Number
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1, 2, 7, 12, 13
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1, 2, 8, 9
			Geographic Area		
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		
			3.6 Wilderness Areas and	Desired Conditions	1
			Wilderness Study Areas	D : 10 10	1.2.2
			3.12 Research Natural Areas	Desired Conditions	1,2,3
			3.16 Falls Creek Archeological	Desired Conditions	8
			Area	D : 10 1::	1
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1
			3.21 Chattanooga Special Botanical	Di1 C1'ti	3, 4, 5
			Area	Standards	9
			3.23 Dolores River Canyon	Desired Conditions	1,2
			3.23 Dolores River Canyon		6,7,8
			2.24 ST 4	Objectives	
			3.24Silverton	Desired Conditions	4, 9, 10
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25
				Objectives	29, 30, 31, 32
			3.27 Rico	Desired Conditions	10, 11, 12
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 12, 37, 38, 39, 40
Western toad (Bufo	NatureServe G4 T1Q,	Spruce fir, Alpine	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 15, 16, 17, 18, 19, 25, 26,
boreas)	BLM and USFS Sensitive,	, 1	Plant Species		27, 35, 36, 37, 38, 39, 41
	State Endangered	Wetlands		Objectives	45, 59, 60, 61
				Standards	65
				Guidelines	69, 70, 76, 84, 85, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13, 17, 18
				Objectives	24, 25, 29, 30
				Guidelines	50, 58
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12
			Ecosystems	Objectives	13, 15
				Standards	19, 20, 21
				Guidelines	22, 24, 25, 26, 27, 28

Species	Source/	Habitat	A	Applicable Plan Component		
	Rank	Rank	Root Number	Component	Component Number	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4, 6, 7, 8, 9	
			Fisheries	Objectives	15, 16	
				Standards	18, 20	
				Guidelines	22, 23, 24, 25, 26, 27, 28	
			2.6 Water Resources	Desired Conditions	1, 2, 6, 7, 8, 9, 10, 12, 13, 14, 15	
				Objectives	19, 21, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4,5	
			Management	Objectives	9	
				Guidelines	16, 17, 21, 22, 23, 24, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	13, 14, 15, 17, 18	
			2.9 Timber and Other Forest Products	Desired Conditions	1,4	
				Objectives	11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
			·	Objectives	8, 9, 10	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 12, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	2,3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4
			Hazardous Materials	Objectives	7
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1, 13
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1, 2, 9
			Geographic Area		
			3.3 Columbine Geographic Area	Desired Conditions	4, 7, 8, 9
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		
			3.6 Wilderness Areas and	Desired Conditions	1
			Wilderness Study Areas		
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.21 Chattanooga Special Botanical	Desired Conditions	3, 4, 5
			Area	Standards	9
			3.24 Silverton	Desired Conditions	10
			3.27 Rico	Desired Conditions	10, 11
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 12, 37, 40
		P	inyon- Juniper Group		
Gray vireo (Vireo	BCC, NatureServe S2	Pinyon-juniper	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 15, 17, 18, 19, 22,
vicinior)	N4B		Plant Species		28, 35, 36, 37, 38, 39, 40
				Objectives	45, 59, 60, 61, 62
				Standards	65
				Guidelines	69, 70, 73, 75, 76, 79, 83, 84, 85, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11 12
				Objectives	24, 25, 30
				Guidelines	55, 58
			2.6 Water Resources	Desired Conditions	12
				Objectives	22, 23
				Guidelines	32, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	7
			Management	Objectives	9
				Guidelines	15, 16, 17, 18, 19, 21, 24, 27, 29, 32, 33, 34

Species Source/ Rank	Source/	Habitat	A	Applicable Plan Component			
		Root Number	Component	Component Number			
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4, 11		
			Products	Standards	12		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16		
			2.12 Air Quality	Desired Conditions	2,7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 25, 27, 28		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28		
				Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		
			2.18 Lands and Special Uses	Desired Conditions	3,4		
			_	Guidelines	13, 15, 16, 27, 30		
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5		
				Objectives	6		
			2.20 Alternative Energy:	Desired Conditions	2, 3		
			Geothermal, Wind, Solar, Biomass				
			2.21 Abandoned Mine and	Desired Conditions	4		
			Hazardous Materials				
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9		
			Conservation Education				
			3.1 Tres Rios Field Office	Desired Conditions	1, 8		
			Geographic Area				
			3.2 Dolores Ranger District	Desired Conditions	2		
			Geographic Area				
			3.3 Columbine Geographic Area	Desired Conditions	4, 10		

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.4 Pagosa Ranger District	Desired Conditions	1	
			Geographic Area			
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.18 Spring Creek Wild Horse	Desired Conditions	15	
			Herd Management Area			
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.25 HD Mountains Unique	Desired Conditions	4, 11, 15, 16, 17, 18, 21, 22, 23, 25	
			Landscape	Objectives	31, 32	
			Appendix H. Oil and Gas*		12, 28, 37, 38, 40	
Pinyon jay (Gymnorhinus cyanocephalus)	BCC	Pinyon-juniper	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 15, 17, 18, 19, 22, 28, 35, 36, 37, 38, 39, 40	
			_	Objectives	45, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 73, 75, 76, 79, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12	
				Objectives	24, 25, 30	
				Guidelines	55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 27, 29, 32, 33, 34,	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4, 11	
			Products	Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
			_	Guidelines	13, 15, 16, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1,8
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	2
			3.3 Columbine Geographic Area	Desired Conditions	4, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	15
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1
			3.25 HD Mountains Unique	Desired Conditions	4, 11, 15, 16, 17, 18, 21, 22, 23, 25
			Landscape	Objectives	31, 32
			Appendix H. Oil and Gas*		12, 28, 37, 38, 40

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			Bighorn Group			
Rocky mountain bighorn sheep (Ovis Canadensis)	State game sps., USFS sensitive species		2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 16, 17, 18, 19, 29, 33, 34, 35, 36, 37, 38, 39	
		country near rugged, rocky		Objectives	45, 46, 57, 58, 59, 62, 63, 64	
		cliffs and bluffs		Standards	65	
				Guidelines	69, 76, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Standards	39, 40, 41, 42	
				Guidelines	50, 58, 62, 63, 64, 65, 66	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Standards	11, 12	
				Guidelines	15, 16, 17, 18, 19, 20, 21, 24, 25, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1,3	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Objectives	8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 37, 38	
				Objectives	59	

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	2, 4	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.3 Columbine Geographic Area	Desired Conditions	4,9	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.24 Silverton	Desired Conditions	4,9	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 31, 32, 33, 37, 38, 40	
Desert bighorn sheep (Ovis canadensis nelsoni)	BLM Sensitive, State game sps., USFS sensitive	Dry desert mountain ranges, foothills near rocky cliffs	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40	
	species but does not occur			Objectives	45, 56, 57, 58, 59, 62	
	on SJNF lands.			Standards	65	
				Guidelines	69, 70, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Standards	39, 40, 41, 42	
				Guidelines	50, 58, 62, 63, 64, 65, 66	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Standards	11, 12	

Species	Source/	Habitat	A	Applicable Plan Component			
	Rank		Root Number	Component	Component Number		
				Guidelines	15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 29,		
					30, 32, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3		
			Products	Standards	12		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			2.11 Fire and Fuels Management	Desired Conditions	6, 7		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	2, 7		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 28		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 38		
				Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		
			2.18 Lands and Special Uses	Desired Conditions	3,4		
				Guidelines	13, 15, 16, 24, 27, 30		
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5		
				Objectives	6		
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3		
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	1, 2, 4		
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9		
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 8		

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern	Guidelines	9	
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 8	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 31, 32, 33, 38, 39	
			Bat Group			
Allen's big-eared bat (Idionycteris phyllotis)	BLM Sensitive	Pinyon-juniper, Ponderosa pine, Abandon mines,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 15, 16, 17, 18, 19, 22, 23, 28, 35, 36, 37, 38, 39, 40	
		Caves		Objectives	45, 52, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 73, 74, 75, 76, 77, 78, 79, 80, 83, 84, 85, 86,	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 28, 29, 30	
				Standards	37, 38	
				Guidelines	51, 52, 53, 54, 58	
			2.5 Aquatic Ecosystems and Fisheries	Guidelines	22	
			2.6 Water Resources	Desired Conditions	9, 11, 12	
				Objectives	22, 33	
				Standards	29	
				Guidelines	35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	27, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1,2,3	
				Objectives	6	

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16, 17
			2.12 Air Quality	Desired Conditions	2,7
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
			_	Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
			_ '	Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	1, 2, 3
			Geothermal, Wind, Solar, Biomass		, ,
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4, 5
			Hazardous Materials	Objectives	7
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1, 2, 10, 15
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1, 2, 7, 11
			Geographic Area		
			3.3 Columbine Geographic Area	Desired Conditions	10
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		
			3.6 Wilderness Areas and	Desired Conditions	1
			Wilderness Study Areas	Di1 C1iti	1.2.2
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1
			3.23 Dolores River Canyon	Desired Conditions	1
			5.25 Dolotes River Catiyoti		8
				Objectives	0

Species	Source/ Rank	Source/ Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30	
			Appendix H. Oil and Gas*		13, 35, 36, 37	
Big free-tailed bat (Nyctinomops macrotis)	BLM Sensitive	Pinyon-juniper, Ponderosa pine, Cliff rock canyons	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 15, 16, 17, 18, 19, 22, 23, 28, 35, 36, 37, 38, 39, 40	
				Objectives	45, 52, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 73, 74, 75, 76, 77, 78, 79, 80, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 14, 17, 18	
			_	Objectives	24, 25, 28, 29, 30	
				Standards	37, 38	
				Guidelines	51, 52, 53, 54, 58	
			2.5 Aquatic Ecosystems and Fisheries	Guidelines	22	
			2.6 Water Resources	Desired Conditions	9, 11, 12	
				Objectives	22, 23	
				Standards	29	
				Guidelines	35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland Management	Desired Conditions	4, 5, 6	
				Objectives	9	
				Guidelines	27, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
				Objectives	6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	

Species	Source/	Source/ Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4, 5	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 10, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 11	
			3.3 Columbine Geographic Area	Desired Conditions	10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.23 Dolores River Canyon	Desired Conditions	1	
				Objectives	8	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30	
			Appendix H. Oil and Gas*		13, 35, 36, 37	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
Fringed myotis (Myotis	BLM and USFS Sensitive	Pinyon-juniper, Ponderosa	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 15, 16, 17, 18, 19,	
thysanodes)		pine	Plant Species		22, 23, 28, 35, 36, 37, 38, 39, 40	
				Objectives	45, 52, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 73, 74, 75, 76, 77, 78, 79, 80, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 28, 29, 30	
				Standards	37, 38	
				Guidelines	51, 52, 53, 54, 58	
			2.5 Aquatic Ecosystems and Fisheries	Guidelines	22	
			2.6 Water Resources	Desired Conditions	9, 11, 12	
				Objectives	22, 23	
				Standards	29	
				Guidelines	35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	27, 28, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
				Objectives	6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	

Rank		Root Number	Component	Component Number
		2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
			Objectives	59
		2.15 Scenery and Visual Resource	Desired Conditions	2
		Management	Guidelines	19
		2.18 Lands and Special Uses	Desired Conditions	3,4
			Guidelines	13, 15, 16, 24, 27, 30
		2.19 Minerals and Energy	Desired Conditions	3, 4, 5
			Objectives	6
			Desired Conditions	1, 2, 3
			Desired Conditions	1, 2, 4, 5
				7
		2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Desired Conditions	1, 2, 10, 15
		3.2 Dolores Ranger District	Desired Conditions	1, 2, 7, 11
			Danimal Can distant	10
				1
		Geographic Area		1
			Desired Conditions	1
			Desired Conditions	1, 2, 3
		3.19 Perins Peak Wildlife	Desired Conditions	1
			Desired Conditions	1
		3.23 Dololes River Callyon		8
		3.25 HD Mountains Unique	,	3, 4, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25
				29, 30
			Objectives	13, 35, 36, 37
S sensitive	Associated with trees. In	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 15, 16, 17, 18, 19, 22, 23, 28, 35, 36, 37, 38, 39, 40
		Fiant Species	Objectives	45, 52, 54, 59, 60, 61, 62
				65
	forests.			69, 70, 73, 74, 75, 76, 77, 78, 83, 84, 85, 86
		2.3 Terrestrial Wildlife		1, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 17, 18
		2.5 Terresurar writing		24, 25, 28, 29, 30
				37, 38
				50, 51, 52, 53, 54, 58
	S sensitive	Colorado it is mainly found in ponderosa pine, pinon/juniper, and riparian	2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass 2.21 Abandoned Mine and Hazardous Materials 2.22 Interpretation and Conservation Education 3.1 Tres Rios Field Office Geographic Area 3.2 Dolores Ranger District Geographic Area 3.4 Pagosa Ranger District Geographic Area 3.6 Wilderness Areas and Wilderness Study Areas 3.12 Research Natural Areas 3.19 Perins Peak Wildlife Management Area 3.23 Dolores River Canyon 3.25 HD Mountains Unique Landscape Appendix H. Oil and Gas* 2.2 Terrestrial Ecosystems and Plant Species	2.19 Minerals and Energy

Species	Source/	Habitat	A	Applicable Plan Component			
	Rank	Root Number	Component	Component Number			
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12		
			Ecosystems	Objectives	13, 16, 17, 18		
				Standards	20, 21		
				Guidelines	22, 24, 25, 26, 27, 28		
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4		
			Fisheries	Objectives	15		
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 12		
				Objectives	19, 22, 23		
				Standards	29, 30		
				Guidelines	32, 35, 36, 37, 38, 39		
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6		
			Management	Objectives	9		
				Guidelines	22, 23, 27, 28, 32, 33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4		
			Products	Objectives	5a, 11		
				Standards	12		
				Guidelines	18		
			2.10 Insects and Disease	Desired Conditions	1, 2, 3		
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8		
				Objectives	11, 12		
				Standards	13, 14		
				Guidelines	15, 16, 17		
			2.12 Air Quality	Desired Conditions	1, 2, 7		
				Objectives	8		
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20		
				Guidelines	21, 22, 23, 24, 25, 26		
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13		
			Management	Objectives	19		
				Standards	22		
				Guidelines	23, 24, 25, 27, 28		
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28		
			-	Objectives	59		
			2.15 Scenery and Visual Resource	Desired Conditions	2		
			Management	Guidelines	19		

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4, 5	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 7, 10, 12, 13, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5, 6	
			Draw Old Growth Recruitment Areas	Objectives	8, 9, 10	
			3.23 Dolores River Canyon	Desired Conditions	1,2	
				Objectives	6, 7, 8	
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
				Objectives	29, 30	
			Appendix H. Oil and Gas*		13, 35, 36, 37	
Spotted bat (Euderma maculatum)	BLM and USFS Sensitive	Pinyon-juniper, Sagebrush shrublands, Semi-desert	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 15, 16, 17, 18, 19, 28, 30, 31, 32, 35, 36, 37, 38, 39, 40, 41	
		shrublands, riparian		Objectives	45, 56, 57, 58, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 73, 75, 76, 77, 78, 79, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 28, 29, 30	
				Standards	37, 38	
				Guidelines	50, 51, 52, 53, 54, 58	

Species	Source/	Habitat	A	oplicable Plan Component		
	Rank	Root Number	Component	Component Number		
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	13, 16, 17, 18	
				Standards	19, 20, 21	
				Guidelines	22, 24, 25, 26, 27, 28	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 4	
			Fisheries	Objectives	15	
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 11, 12, 13	
				Objectives	19, 22, 23	
				Standards	29, 30	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 5, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27,	
					28, 29, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3. 4	
			Products	Objectives	11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16, 17	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	

Species	Source/	Habitat	A	mponent	
	Rank		Root Number	Component	Component Number
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	1, 2, 3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4, 5
			Hazardous Materials	Objectives	7
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1, 2, 12, 13
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1, 2, 8, 9
			Geographic Area		
			3.3 Columbine Geographic Area	Desired Conditions	4, 10
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of	Desired Conditions	1
			Critical Environmental Concern		
			3.18 Spring Creek Wild Horse	Desired Conditions	5
			Herd Management Area		
			3.23 Dolores River Canyon	Desired Conditions	1,2
				Objectives	6, 7, 8
			3.25 HD Mountains Unique	Desired Conditions	3. 4. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25
			Landscape	Objectives	29,30
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 13, 35, 36, 37
_	BLM and USFS Sensitive,	Abandoned mines, Caves	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 15, 16, 17, 19,
(Plecotus townsendii)	State special concern,		Plant Species		22, 23, 28, 29, 30, 31, 35, 36, 38, 39, 40
	NatureServe S2			Objectives	45, 52, 54, 55, 56, 58, 59, 60, 62
				Standards	65
				Guidelines	69, 73, 74, 75, 76, 77, 78, 79, 83, 84, 85, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 9, 10, 11, 12, 14, 17, 18
				Objectives	24, 25, 29, 30
				Standards	37, 38
				Guidelines	51, 52, 53, 54, 58
			2.6 Water Resources	Desired Conditions	12
				Objectives	22, 23
				Guidelines	32, 36, 37, 38, 39

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 7, 8	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
			_	Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
				Objectives	6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	1, 2, 3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	1, 2, 4, 5	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	

			pplicable Plan Co	olicable Plan Component		
	Rank		Root Number	Component	Component Number	
			3.1 Tres Rios Field Office	Desired Conditions	1, 10, 15	
			Geographic Area			
			3.2 Dolores Ranger District	Desired Conditions	1, 7, 11	
			Geographic Area			
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District	Desired Conditions	1	
			Geographic Area	5		
			3.6 Wilderness Areas and	Desired Conditions	1	
			Wilderness Study Areas	Desired Conditions	1.2.2	
			3.12 Research Natural Areas 3.13 Gypsum Valley Area of	Desired Conditions  Desired Conditions	1, 2, 3	
			Critical Environmental Concern	Desired Conditions		
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area	Desired Conditions		
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 6	
			Draw Old Growth Recruitment Areas	- · J · · · · · · ·	8, 9, 10	
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, m25	
				Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		13, 35, 36, 37	
			Semi-Desert Shrubland Group			
Loggerhead shrike (Lanius ludovicianus)	USFS Sensitive	Riparian, Pinyon-juniper, Sagebrush shrublands,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 19, 28, 30, 31, 32 35, 36, 37, 38, 39, 40, 41	
		Grasslands, Semi-desert		Objectives	45, 56, 58, 59, 60, 62	
		shrublands		Standards	65	
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	

Species	Source/	Source/ Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
				Desired Conditions	1, 5, 11, 20, 22, 25, 28, 37, 38	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3, 4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 8, 11	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.3 Columbine Geographic Area	Desired Conditions	4, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions		
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern			
			3.16 Falls Creek Archeological	Desired Conditions	8	
			Area			
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area			
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.23 Dolores River Canyon	Objectives	8	
			3.24 Silverton	Desired Conditions		
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 11, 14, 15, 16, 17, 18, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		10, 11, 28, 38, 40	
Brewer's sparrow (Spizella breweri)	BLM and USFS Sensitive	Sagebrush shrublands, Semi-desert shrublands	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 30, 32, 35, 36, 37, 38, 39, 40	
				Objectives	45, 56, 57, 58, 59, 62	
				Standards	65	
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1,3	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	

Species	Source/	Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.12 Air Quality	Desired Conditions	2,7
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
			•	Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6 8, 9
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 8, 11
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1
			3.3 Columbine Geographic Area	Desired Conditions	4, 10
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3
			3.13 Gypsum Valley Area of Critical Environmental Concern	Desired Conditions	1
			3.18 Spring Creek Wild Horse Herd Management Area	Desired Conditions	5
			Appendix H. Oil and Gas*		10, 11, 28, 38, 40

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
Sage sparrow	BCC	Plan components provide	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 9, 11, 12, 14, 16, 17, 18, 30, 35,	
(Amphispiza belli)		species diversity	Plant Species		36, 37 38, 39, 40	
		components. BLM		Objectives	45, 59, 62	
		breeding, no breeding		Standards	65	
		habitat on USFS. Plan		Guidelines	69, 73, 75, 76, 79, 80, 86	
		objectives for ecology	2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 10, 11, 12	
		invasives, fire and fuels better represented through		Objectives	24, 25, 30	
		loggerhead shrike.		Guidelines	55, 58	
		loggeriicad siirike.	2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	3	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	6,7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	2,7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 27, 30	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	2, 3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials			
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 8, 11	
			Geographic Area	5 1 1 2 111		
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern	D : 10 IV	15	
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area		10 11 20 20	
D ( 1 1 1	DIMC '.'	C 1 1 1 1 1 1	Appendix H. Oil and Gas*	Danimal Canalitiana	10, 11, 28, 38	
Desert spiny lizard (Sceloporus magister)	BLM Sensitive, NatureServe S2 N5	Sagebrush shrublands, Semi-desert shrublands, near flowing streams	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 30, 31, 32, 35, 36, 37, 38, 39, 40	
				Objectives	45, 56, 57, 58, 59, 60, 62	
				Standards	65	
				Guidelines	69, 73, 75, 76, 79, 80, 84, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 10, 11, 12, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 5, 6, 7	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 11, 12	
				Guidelines	19	
			2.9 Timber and Other Forest	Desired Conditions	3	
			Products	Standards	12	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
				Standards	13, 14
				Guidelines	15, 16
			2.12 Air Quality	Desired Conditions	2,7
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 3
			Management	Objectives	19
				Standards	22
				Guidelines	23, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3,4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	2,3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	4
			Hazardous Materials		
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1,8
			Geographic Area		
			3.13 Gypsum Valley Area of	Desired Conditions	1
			Critical Environmental Concern	D 1 10 10	-
			3.18 Spring Creek Wild Horse	Desired Conditions	5
			Herd Management Area		10 11 20
T 1	DIM Compidions Chada	C	Appendix H. Oil and Gas*	Di1 C1'ti	10, 11, 38
Longnose leopard lizard (Gambelia wislizenii)	BLM Sensitive, State special concern,	Sagebrush shrublands, Semi-desert shrublands,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 16, 17, 18, 30, 31, 35, 36, 37, 38, 39, 40
	NatureServe S1 N5	with open ground		Objectives	45, 56, 57, 58, 59, 60, 62
				Standards	65
				Guidelines	69, 73, 75, 76, 79, 80 84, 86
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 10, 11, 12, 14, 17, 18
				Objectives	24, 25, 29, 30
				Guidelines	50, 58

Species	Source/	Source/ Habitat	A	pplicable Plan Co	mponent
	Rank		Root Number	Component	Component Number
			2.6 Water Resources	Desired Conditions	12
				Objectives	22, 23
				Guidelines	32, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	2, 4, 6, 7
			Management	Objectives	9
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 29, 30, 32, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
			-	Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	19
			2.9 Timber and Other Forest	Desired Conditions	3
			Products	Standards	12
			2.10 Insects and Disease	Desired Conditions	1, 2, 3
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16
			2.12 Air Quality	Desired Conditions	2,7
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 3
			Management	Objectives	19
				Standards	22
				Guidelines	23, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3, 4
				Guidelines	13, 15, 16, 24, 27, 30
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	2, 3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.1 Tres Rios Field Office	Desired Conditions	1,8	
			Geographic Area			
			3.13 Gypsum Valley Area of	Desired Conditions	1	
			Critical Environmental Concern			
			3.18 Spring Creek Wild Horse	Desired Conditions	5	
			Herd Management Area		10 11 20	
		G 4: N	Appendix H. Oil and Gas*		10, 11, 38	
	<u> </u>	•	ter and Snag Dependent Group			
Purple martin (Progne subis)	USFS Sensitive	Aspen	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	2, 3, 4, 5, 6, 8, 9, 15, 16, 17, 18, 19, 21, 27, 35, 36, 37, 38, 39	
				Objectives	45, 50, 51, 59, 62	
				Standards	65	
				Guidelines	69, 70, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 35, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4, 5, 6	
			Management	Objectives	9	
				Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 27, 29, 30, 32 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5c, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
			·	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	1	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	2, 3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 14	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 10	
			3.3 Columbine Geographic Area	Desired Conditions	4,9	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			Appendix H. Oil and Gas*		7, 8, 9, 12, 28, 37, 40	
Lewis' woodpecker (Bombycilla garrulous)	BCC, USFS Sensitive	Riparian, Pinyon-juniper, Ponderosa pine	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 15, 17, 18, 19, 22, 23, 28, 35, 36, 37, 39, 40	
				Objectives	45, 52, 54, 59, 61, 62	
				Standards	65	
				Guidelines	69, 70, 74, 76, 77, 78, 83, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12, 13, 14, 15, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 55, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	16, 17, 18	

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
				Standards	20, 21
				Guidelines	22, 24, 25, 26, 27, 28
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4
			Fisheries	Objectives	15
			2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 12, 13
				Objectives	19, 22, 23
				Standards	29, 30
				Guidelines	32, 35, 36, 37, 38, 39
			2.7 Livestock and Rangeland	Desired Conditions	4, 5
			Management	Objectives	9
				Guidelines	15, 16, 17, 18, 19, 21, 22, 23 24, 25, 27, 28, 29, 30, 32, 33, 34
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5
			_	Objectives	6, 7, 8, 9
				Standards	10, 12
				Guidelines	18
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4
			Products	Objectives	5a, 11
				Standards	12, 16
				Guidelines	18
			2.10 Insects and Disease	Desired Conditions	1, 2, 3
				Objectives	6
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8
				Objectives	11, 12
				Standards	13, 14
				Guidelines	15, 16, 17
			2.12 Air Quality	Desired Conditions	2,7
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20
				Guidelines	21, 22, 23, 24, 25, 26
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13
			Management	Objectives	19
				Standards	22
				Guidelines	23, 24, 25, 27, 28
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28
				Objectives	59
			2.15 Scenery and Visual Resource	Desired Conditions	2
			Management	Guidelines	19
			2.18 Lands and Special Uses	Desired Conditions	3, 4
				Guidelines	13, 15, 16, 24, 27, 30

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials	Objectives	7	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 2, 10, 12, 13, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 2, 7, 8, 9, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 4, 5, 7	
			Draw Old Growth Recruitment Areas	Objectives	8, 9, 10	
			3.23 Dolores River Canyon	Desired Conditions	1, 2	
				Objectives	6, 7, 8	
			3.25 HD Mountains Unique Landscape	Desired Conditions	3, 4, 8, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
				Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 12, 13, 28, 38, 39, 40	
Hairy woodpecker (Picoides villosus)	MIS	Aspen, Ponderosa pine, Mixed conifer, Spruce fir,	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 35, 36, 37, 38, 39	
		Pinyon juniper	-	Objectives	45, 48, 49, 50, 51, 52, 53, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 74, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 7, 10, 12, 19, 23	
				Objectives	24, 25, 30, 34	
				Guidelines	55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23,	
				Guidelines	32, 36, 37, 38, 39	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.7 Livestock and Rangeland	Desired Conditions	4	
			Management	Standards	14	
				Guidelines	33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 5c, 11	
				Standards	12, 16	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5, 6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3, 4	
				Guidelines	13, 15, 16, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	2,3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials			
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 10, 14, 15	
			Geographic Area			

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			3.2 Dolores Ranger District	Desired Conditions	1, 7, 10, 11	
			Geographic Area			
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District	Desired Conditions	1	
			Geographic Area			
			3.6 Wilderness Areas and	Desired Conditions	1	
			Wilderness Study Areas	D 1 10 111	1.2.2	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions		
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5, 6	
			Draw Old Growth Recruitment Areas		8, 9, 10	
			3.24. Silverton	Desired Conditions	δ, 9, 10	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 11, 15, 16, 17, 18, 19, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*	Objectives	7, 8, 9, 12, 13, 28, 37, 38, 40	
Flammulated owl (Otus	BCC, USFS Sensitive	Aspen, Ponderosa pine,	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, 15, 17, 18, 19,	
flammeolus)		Mixed conifer, Spruce fir	Plant Species		21, 22, 23, 24, 25, 26, 27, 35, 36, 37, 38, 39	
			•	Objectives	45, 48, 49, 50, 51, 52, 53, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 73, 74, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 7, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	50, 55, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4	
			Management	Guidelines	34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
			Products	Objectives	5a, 5c, 11	
				Standards	12, 16	
			210 1 15	Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5,6	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	5	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2,3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 10, 14, 15	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 7, 10, 11	
			3.3 Columbine Geographic Area	Desired Conditions	4, 9, 10	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1	
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife Management Area	Desired Conditions	1	
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5, 6	
				Objectives	8, 9, 10	
			3.24. Silverton	Desired Conditions	4	
			3.25 HD Mountains Unique	Desired Conditions	3, 4, 11, 15, 16, 17, 18, 19, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
			Appendix H. Oil and Gas*	Î	7, 8, 9, 12, 13, 28, 29, 30, 37, 38, 40	
Williamson's sapsucker	BCC	Aspen, Ponderosa pine	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, 15, 17, 18, 19,	
(Sphyrapicus thyroideus)			Plant Species		21, 22, 23, 27, 35, 36, 37, 38, 39	
				Objectives	45, 50, 51, 52, 54, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 73, 74, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 10, 11, 12	
				Objectives	24, 25, 30	
				Guidelines	55, 58	
			2.6 Water Resources	Desired Conditions	12, 22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4	
			Management	Guidelines	33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
				Guidelines	18	
			2.9 Timber and Other Forest Products	Desired Conditions	1, 3, 4	
				Objectives	5a, 5c, 11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
				Objectives	5, 6	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
			2.12 Air Quality	Desired Conditions	1, 2, 7	
			-	Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
				Standards	22	
				Guidelines	23, 24, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	

Species	Source/	Habitat	Applicable Plan Component			
	Rank		Root Number Component		Component Number	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy:	Desired Conditions	2,3	
			Geothermal, Wind, Solar, Biomass			
			2.21 Abandoned Mine and	Desired Conditions	4	
			Hazardous Materials			
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9	
			Conservation Education			
			3.1 Tres Rios Field Office	Desired Conditions	1, 10, 14, 15	
			Geographic Area			
			3.2 Dolores Ranger District	Desired Conditions	1, 7, 10, 11	
			Geographic Area			
			3.3 Columbine Geographic Area	Desired Conditions	4,9	
			3.4 Pagosa Ranger District	Desired Conditions	1	
			Geographic Area			
			3.6 Wilderness Areas and	Desired Conditions	1	
			Wilderness Study Areas			
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3	
			3.19 Perins Peak Wildlife	Desired Conditions	1	
			Management Area			
			3.22 Smoothing Iron and Boggy	Desired Conditions	1, 2, 3, 5, 6	
			Draw Old Growth Recruitment Areas		8, 9, 10	
			_	Desired Conditions	3, 4, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	
			Landscape	Objectives	29, 30, 31, 32	
			Appendix H. Oil and Gas*		7, 8, 9, 12, 13, 28, 37, 38, 40	
Boreal owl (Aegolius	USFS Sensitive,	Aspen, Riparian, Mixed	2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 17, 18, 19, 21,	
funereus)	NatureServe S2	conifer, Spruce fir	Plant Species		25, 26, 27, 35, 36, 37, 38, 39	
				Objectives	45, 48, 49, 50, 51, 59, 60, 61, 62	
				Standards	65	
				Guidelines	69, 70, 74, 76, 77, 78, 82, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18	
				Objectives	24, 25, 29, 30, 49, 50, 55, 58	
			2.4 Riparian Area and Wetland	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 10, 11, 12	
			Ecosystems	Objectives	17,	
				Standards	20, 21	
				Guidelines	1, 2, 3, 4	
			2.5 Aquatic Ecosystems and	Desired Conditions	1, 2, 3, 4	
			Fisheries	Objectives	15	

Species	Source/ Habit Rank	Applicable Plan Component			
		Root Number	Component	Component Number	
		2.6 Water Resources	Desired Conditions	6, 7, 8, 9, 12, 13	
			Objectives	19, 22, 23	
			Standards	29, 30,	
			Guidelines	32, 35, 36, 37, 38, 39	
		2.7 Livestock and Rangeland	Desired Conditions	4	
		Management	Guidelines	28, 33, 34	
		2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
			Objectives	6, 7, 8, 9	
			Standards	10, 12	
			Guidelines	18	
		2.9 Timber and Other Forest	Desired Conditions	1, 3, 4	
		Products	Objectives	11	
			Standards	12, 16	
			Guidelines	18	
		2.10 Insects and Disease	Desired Conditions	1, 2, 3, 4	
			Objectives	5	
		2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 8, 9	
			Objectives	11, 12	
			Standards	13, 14	
			Guidelines	15, 16, 17	
		2.12 Air Quality	Desired Conditions	1, 2, 7	
			Objectives	8	
			Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
			Guidelines	21, 22, 23, 24, 25, 26	
		2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
		Management	Objectives	19	
			Standards	22	
			Guidelines	23, 24, 25, 27, 28	
		2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 37, 38	
			Objectives	59	
		2.15 Scenery and Visual Resource	Desired Conditions	2	
		Management	Guidelines	19	
		2.18 Lands and Special Uses	Desired Conditions	3,4	
			Guidelines	13, 15, 16, 24, 27, 30	
		2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
			Objectives	6	
		2.20 Alternative Energy:	Desired Conditions	1, 2, 3	
		Geothermal, Wind, Solar, Biomass			

Species	Source/	Habitat	Applicable Plan Component				
	Rank		Root Number	Component	Component Number		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4		
			Hazardous Materials	Objectives	7		
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9		
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1, 14		
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1, 10		
			3.3 Columbine Geographic Area	Desired Conditions	4,9		
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1		
			3.6 Wilderness Areas and Wilderness Study Areas	Desired Conditions	1		
			3.12 Research Natural Areas	Desired Conditions	1, 2, 3		
			3.24 Silverton	Desired Conditions	4, 9, 10		
			Appendix H. Oil and Gas*		1, 2, 3, 4, 5, 6, 7, 8, 9, 28, 29, 30, 37, 40		
		Alj	pine/Spruce-Fir Group				
American marten (Martes americana)	USFS Sensitive, MIS	Spruce fir, Alpine tundra, Mixed conifer	2.2 Terrestrial Ecosystems and Plant Species	Desired Conditions	1, 2, 3, 4, 5, 69, 15, 17, 18, 19, 26, 35, 36, 37, 38, 39		
				Objectives	45, 48, 59, 60, 61, 62		
				Standards	65		
				Guidelines	69, 70, 76, 77, 78, 83, 84, 85, 86		
			2.3 Terrestrial Wildlife	Desired Conditions	1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 17, 18, 19, 21		
				Objectives	24, 25, 29, 30, 32		
				Guidelines	50, 58		
			2.6 Water Resources	Desired Conditions	12		
				Objectives	22, 23		
				Guidelines	32, 36, 37, 38		
			2.7 Livestock and Rangeland	Desired Conditions	4		
			Management	Objectives	14		
				Guidelines	33, 34		
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5		
				Objectives	6, 7, 8, 9		
				Standards	10, 12		
				Guidelines	18		
			2.9 Timber and Other Forest	Desired Conditions	1, 3, 4		
			Products	Objectives	11		
				Standards	12		
				Guidelines	18		

Species	Source/	Source/ Habitat Rank	Applicable Plan Component			
	Rank		Root Number	Component	Component Number	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 9	
				Objectives	11, 12	
				Standards	13, 14	
				Guidelines	15, 16	
				Desired Conditions	1, 2, 7, 8	
				Standards	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	
				Guidelines	21, 22, 23, 24, 25, 26	
			2.13 Access and Travel	Desired Conditions	1, 2, 8, 13	
			Management	Objectives	19	
			Gu	Standards	22	
				Guidelines	23, 25, 27, 28	
			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 37, 38	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	19	
			2.18 Lands and Special Uses	Desired Conditions	3,4	
				Guidelines	13, 15, 16, 24, 27, 30	
			2.19 Minerals and Energy	Desired Conditions	3, 4, 5	
				Objectives	6	
			2.20 Alternative Energy: Geothermal, Wind, Solar, Biomass	Desired Conditions	2, 3	
			2.21 Abandoned Mine and Hazardous Materials	Desired Conditions	4	
			2.22 Interpretation and Conservation Education	Desired Conditions	1, 3, 6, 8, 9	
			3.1 Tres Rios Field Office Geographic Area	Desired Conditions	1	
			3.2 Dolores Ranger District Geographic Area	Desired Conditions	1	
			3.3 Columbine Geographic Area	Desired Conditions	4,9	
			3.4 Pagosa Ranger District Geographic Area	Desired Conditions	1	
			3.12. Research Natural Areas	Desired Conditions	1, 2, 3	
			3.24 Silverton	Desired Conditions	4,9	
			Appendix H. Oil and Gas*	2 contra Contamons	7, 8, 9, 12, 38, 70	

Species	Source/ Rank	Habitat	Applicable Plan Component			
			Root Number	Component	Component Number	
North American			2.2 Terrestrial Ecosystems and	Desired Conditions	1, 2, 3, 4, 5, 6, 9, 15, 16, 17, 18, 19, 26, 34,	
wolverine (Gulo gulo)	Proposed Threatened,		Plant Species		35, 36, 37, 38, 39	
	NatureServe S1			Objectives	45, 48, 59, 60, 62, 63, 64	
				Standards	65	
				Guidelines	69, 70, 76, 77, 78, 83, 84, 85, 86	
			2.3 Terrestrial Wildlife	Desired Conditions	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 17, 18	
				Objectives	24, 25, 29, 30	
				Guidelines	49, 50, 58	
			2.6 Water Resources	Desired Conditions	12	
				Objectives	22, 23	
				Guidelines	32, 36, 37, 38, 39	
			2.7 Livestock and Rangeland	Desired Conditions	4	
			Management	Guidelines	15, 16, 17, 18, 19, 21, 24, 25, 27, 29, 30, 32, 33, 34	
			2.8 Invasive Species	Desired Conditions	1, 2, 3, 4, 5	
				Objectives	6, 7, 8, 9	
				Standards	10, 12	
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			2.9 Timber and Other Forest Products	Desired Conditions	1, 3, 4	
				Objectives	11	
				Standards	12	
				Guidelines	18	
			2.10 Insects and Disease	Desired Conditions	1, 2, 3	
			2.11 Fire and Fuels Management	Desired Conditions	3, 6, 7, 9	
				Objectives	11, 12	
				Standards	13, 14	
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			2.12 Air Quality	Desired Conditions	1, 2, 7	
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			2.13 Access and Travel	Desired Conditions	1, 2, 8	
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			2.14 Recreation	Desired Conditions	1, 5, 11, 20, 22, 25, 28, 36, 37, 38	
				Objectives	59	
			2.15 Scenery and Visual Resource	Desired Conditions	2	
			Management	Guidelines	9	

Species	Source/	Habitat	Applicable Plan Component		
	Rank		Root Number	Component	Component Number
			2.18 Lands and Special Uses	Desired Conditions	3,4
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			2.19 Minerals and Energy	Desired Conditions	3, 4, 5
				Objectives	6
			2.20 Alternative Energy:	Desired Conditions	2, 3
			Geothermal, Wind, Solar, Biomass		
			2.21 Abandoned Mine and	Desired Conditions	1, 2, 4
			Hazardous Materials		
			2.22 Interpretation and	Desired Conditions	1, 3, 6, 8, 9
			Conservation Education		
			3.1 Tres Rios Field Office	Desired Conditions	1
			Geographic Area		
			3.2 Dolores Ranger District	Desired Conditions	1
			Geographic Area		
			3.3 Columbine Geographic Area	Desired Conditions	4
			3.4 Pagosa Ranger District	Desired Conditions	1
			Geographic Area		
			3.6. Wilderness Areas and	Desired Conditions	1
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			3.24 Silverton	Desired Conditions	4, 9
			Appendix H. Oil and Gas*		7, 8, 9, 12, 38, 40

\*Footnote: Appendix H Oil and Gas Stipulation Key.

1 Major River Corridors (NSO)	23 Gunnison Sage Grouse Habitat (LN)
2 Perennial Streams, Water Bodies, Riparian Areas and Fens (NSO)	24 Gunnison Sage Grouse Proposed Occupied Critical Habitat (NSO)
3 Perennial Streams, Water Bodies, Riparian Areas and Fens (CSU)	25 Gunnison Sage Grouse Proposed Occupied Critical Habitat (CSU)
4 Intermittent and Ephemeral Streams* (NSO)	26 Gunnison Sage Grouse Proposed Unoccupied Critical Habitat (CSU)
5 Intermittent and Ephemeral Streams* (CSU)	27 Gunnison Sage Grouse Noise Restriction (CSU)
6 Groundwater Resources* (Shallow) (CSU)	28 Columbian Sharp-tailed Grouse Lek Site (NSO)
7 Groundwater Resources* (CSU)	29 Columbian Sharp-tailed Grouse Noise Restrictions (CSU)
8 Reservoirs & Lakes (NSO)	30 Columbian Sharp-tailed Grouse Noise Restrictions (TL)
9 Lands With Slopes Greater Than 35 Percent (NSO)	31 Migratory Birds (LN)
10 Lands With 25 To 35 Percent Slopes* and Lands With Shale Soils (CSU)	32 Eagles, All Accipiters, Falcons, Buteos, and Owls* (NSO)
11 Lands Prone To Mass Movement (NSO)	33 Eagles, All Accipiters, Falcons, Buteos, and Owls* (TL)
12 Lands with Gypsum Soils (CSU)	34 Big Game Parturition (TL)
13 Lands With Biological Soil Crusts* (CSU)	35 Big Game Severe Winter Range, Winter Concentration, and Mule Deer Critical Winter Range and Big Game
14 Special Botanical Areas (NSO)	Production Areas (CSU)
15 Research Natural Areas (NSO)	36 Big Game Winter Range (TL)
16 Old Growth Forests & Woodlands (NSO)	37 Gunnison Prairie Dog (CSU)
17 Mexican Spotted Owl (LN)	38 Bats (LN)
18 Mexican Spotted Owl (NSO)	39 Bats* (NSO)
19 Lynx, Landscape Linkage, Denning And Winter Foraging Habitat (CSU)	40 SJNF Colorado Roadless Areas (NSO)
20 Lynx Denning Sites* (TL)	41 BLM Lands with Wilderness Characteristics (NSO)
21 Southwest Willow Flycatcher (NSO)	42 Dolores River Canyon (NSO)
22 Southwest Willow Flycatcher (TL)	43 SJNF Management Area 1 – Natural Processes Dominate (NSO)

San Juan National Forest Final Land and Resource Management Plan Tres Rios Field Office Proposed Land and Resource Management Plan

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# Appendix N Sage-grouse Best Management Practices

# SAGE-GROUSE BEST MANAGEMENT PRACTICES

Adopted from 2011 Bureau of Land Management (BLM) Technical Report: A Report on National Greater Sage-grouse Conservation Measures

# **Travel and Transportation**

- Conduct restoration of roads, primitive roads, and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in wilderness study areas and within lands managed for wilderness characteristics that have been selected for protection.
- When reseeding roads, primitive roads, and trails, use appropriate seed mixes and consider the use of transplanted sagebrush.

#### Recreation

 Only allow special recreation permits that have neutral or beneficial effects to priority habitat areas.

# Lands/Realty

- Evaluate and take advantage of opportunities to remove, bury, or modify existing power lines within priority sage-grouse habitat areas. Sage-grouse may avoid power lines because of increased predation risk (Lammers and Collopy 2007; Steenhof et al. 1993). Power lines effectively influence (direct physical area plus estimated area of effect due to predator movements) at least 39% of the sage-grouse range (Knick et al. 2011). Deaths resulting from collisions with power lines were an important source of mortality for sage-grouse in southeastern Idaho (Beck et al. 2006; 75 Federal Register 13910)
- Where existing leases or rights-of-way (ROWs) have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat.
- Identify areas where acquisitions (including subsurface mineral rights) or conservation easements would benefit sage-grouse habitat.

# **Land Tenure Adjustment**

- Retain public ownership of priority sage-grouse habitat. Consider exceptions where:
  - There is mixed ownership and land exchanges would allow for additional or more contiguous federal ownership patterns within the priority sage-grouse habitat area.
  - Under priority sage-grouse habitat areas with minority federal ownership, include an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure consideration should be given to pursuing a permanent conservation easement.
- Where suitable conservation actions cannot be achieved, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase or exchange in order to best conserve, enhance, or restore sage-grouse habitat.

# **Proposed Land Withdrawals**

 Do not approve withdrawal proposals not associated with mineral activity unless the land management is consistent with sage-grouse conservation measures. (For example, in a proposed withdrawal for a military training range buffer area, manage the buffer area with sage-grouse conservation measures.)

# **Range Management**

- Work cooperatively on integrated ranch planning within sage-grouse habitat so operations with deeded/Bureau of Land Management (BLM) allotments can be planned as single units.
- Develop specific objectives to conserve, enhance, or restore priority sage-grouse habitat based on Ecological Site Descriptions and assessments (including within wetlands and riparian areas). If an effective grazing system that meets sage-grouse habitat requirements is not already in place, analyze at least one alternative that conserves, restores, or enhances sage-grouse habitat in the National Environmental Policy Act (NEPA) document prepared for the permit renewal (Doherty et al. 2011; Williams et al. 2011).
- Manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve sage-grouse seasonal habitat objectives.
- Authorize new water development for diversion from spring or seep source only when priority sage-grouse habitat would benefit from the development. This includes developing new water sources for livestock as part of an allotment management plan (AMP)/conservation plan to improve sage-grouse habitat.
- Analyze springs, seeps, and associated pipelines to determine if modifications are necessary to
  maintain the continuity of the pre-development riparian area within priority sage-grouse habitats.
  Make modifications where necessary, considering impacts to other water uses when such
  considerations are neutral or beneficial to sage-grouse.
- Only allow treatments that conserve, enhance, or restore sage-grouse habitat (this includes treatments that benefit livestock as part of an AMP/conservation plan to improve sage-grouse habitat.
- Evaluate the role of existing seedings that are currently composed of primarily introduced
  perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be
  restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings are part of an
  AMP/conservation plan or if they provide value in conserving or enhancing the rest of the priority
  habitats, then no restoration would be necessary. Assess the compatibility of these seedings for
  sage-grouse habitat or as a component of a grazing system during the land health assessments
  (Davies et al. 2011).
- Design any new structural range improvements and location of supplements (salt or protein blocks) to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to cattleguards, fences, exclosures, corrals or other livestock handling structures, pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels, and spring developments. Potential for invasive species establishment or increase following construction must be considered in the project planning process and monitored and treated post-construction.
- Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance, or restore sage-grouse habitat.
  - To reduce outright sage-grouse strikes and mortality, remove, modify, or mark fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009; Stevens 2011).
  - Monitor for and treat invasive species associated with existing range improvements (Bergquist et al. 2007; Gelbard and Belnap 2003).

# Riparian Areas

 Where riparian areas and wet meadows meet proper functioning condition, strive to attain reference state vegetation relative to the ecological site description.

# Wild Horses and Burros

 Manage wild horse and burro population levels within established appropriate management levels.

- Prioritize gathers in priority sage-grouse habitat, unless removals are necessary in other areas to prevent catastrophic environmental issues, including herd health impacts.
- Within priority sage-grouse habitat, develop or amend herd management area plans to incorporate sage-grouse habitat objectives and management considerations for all BLM herd management areas (HMAs).
  - For all HMAs within priority sage-grouse habitat, prioritize the evaluation of all appropriate management levels based on indicators that address structure/condition/composition of vegetation and measurements specific to achieving sage-grouse habitat objectives.
- Coordinate with other resources (range, wildlife, and riparian) to conduct land health assessments to determine existing structure/condition/composition of vegetation within all BLM HMAs.
- When conducting NEPA analysis for wild horse and burro management activities, water
  developments or other rangeland improvements for wild horses in priority sage-grouse habitat,
  address the direct and indirect effects to sage-grouse populations and habitat. Implement any
  water developments or rangeland improvements using the criteria identified for domestic livestock
  identified above in priority habitats.

#### **Salable Mineral Materials**

 Restore saleable mineral pits no longer in use to meet sage-grouse habitat conservation objectives.

# **Habitat Restoration**

- Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit sage-grouse (Meinke et al. 2009).
- Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007), or, if available, state sage-grouse conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within priority sage-grouse habitat areas the highest restoration priority.
- Require use of native seeds for restoration based on availability, adaptation (ecological site
  potential), and probability of success (Richards et al. 1998). Where probability of success or
  adapted seed availability is low, non-native seeds may be used as long as they support sagegrouse habitat objectives (Pyke 2011).
- Design post-restoration management to ensure long-term persistence. This could include changes in livestock grazing management, wild horse and burro management and travel management, etc., to achieve and maintain the desired condition of the restoration effort that benefits sage-grouse (Eiswerth and Shonkwiler 2006).
- Restore native (or desirable) plants and create landscape patterns that most benefit sage-grouse.
- Re-establish of sagebrush cover and desirable understory plants (relative to ecological site potential) the highest priority for restoration efforts.
- In fire-prone areas where sagebrush seed is required for sage-grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production (Armstrong 2007) and are a priority for protection from outside disturbances.

# Best Management Practices for How to Make a Pond that Would Not Produce Mosquitoes that Transmit West Nile Virus (from Doherty 2007)

- The following are seven distinct site modifications that if adhered to, would minimize exploitation
  of ponds by Culex tarsalis:
- Increase the size of ponds to accommodate a greater volume of water than is discharged. This
  would result in unvegetated and muddy shorelines that breeding *Culex tarsalis* avoid (De Szalay
  and Resh 2000). This modification may reduce *Culex tarsalis* habitat but could create larval
  habitat for *Culicoides onorensis*, a vector of blue tongue disease, and should be used sparingly

- (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
- 2. Build steep shorelines to reduce shallow water (>60 cm) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species Culex tarsalis, which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
- 3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low-lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce five to 10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars, which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
- 4. Construct dams or impoundments that restrict downslope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
- 5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- 6. Line the overflow spillway with crushed rock and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
- 7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure, and create hoof print pockets of water that are attractive to breeding mosquitoes.

# **Fluid Mineral Development**

**Occupied Gunnison sage-grouse Habitat:** Best management practices (BMPs) are continuously improving as new science and technology become available and therefore are subject to change. Include from the following BMPs those that are appropriate to mitigate effects from the approved action.

#### Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

#### **Operations**

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.

- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside priority areas. Have no tanks at well locations within
  priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck
  traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g., a pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other aboveground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Evangelista et al. 2011) (e.g., by washing vehicles and equipment.)
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus.
   If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low-lying areas.
  - Construct dams or impoundments that restrict downslope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Limit noise to less than 10 decibels above ambient measures (20–24 A-weighted decibels) at sunrise at the perimeter of a lek during active lek season (Blickley et al. in preparation; Patricelli et al. 2010).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside priority habitats.

#### Reclamation

- Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling, and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.

- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

# **Locatable Mineral Development**

BMPs are continuously improving as new science and technology become available and therefore are subject to change. Include from the following BMPs those that are appropriate to mitigate effects from the approved action.

#### Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e.g., use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads by restoring original landform and establishing desired vegetation.

## **Operations**

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other aboveground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Bergquist et al. 2007; Gelbard and Belnap 2003).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus.
   If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
  - Overbuild size of ponds for muddy and non-vegetated shorelines.
  - Build steep shorelines to decrease vegetation and increase wave actions.
  - Avoid flooding terrestrial vegetation in flat terrain or low-lying areas.
  - Construct dams or impoundments that restrict downslope seepage or overflow.
  - Line the channel where discharge water flows into the pond with crushed rock.
  - Construct spillway with steep sides and line it with crushed rock.
  - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse–safe fences around sumps.

- Clean up refuse (Bui et al. 2010).
- Locate man camps outside priority sage-grouse habitats.

#### Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post-reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling, and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

# Fire and Fuels (Instruction Memorandum 2011-138)

## Fuels Management Best Management Practices

- Design fuels management projects in priority sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007).
- In priority sage-grouse habitat areas, prioritize suppression, immediately after life and property, to conserve the habitat.
- Prioritize native seed allocation for use in sage-grouse habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from emergency stabilization and rehabilitation projects outside priority sage-grouse habitat to those inside it. Use of native plant seeds for emergency stabilization and rehabilitation seedings is required based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential would be the highest priority for rehabilitation efforts.
- Design post-emergency stabilization and rehabilitation management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain the desired condition of emergency stabilization and rehabilitation projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006).
- Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns that most benefit sagegrouse habitat.
- Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
- Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
- Ensure proposed sagebrush treatments are planned with interdisciplinary input from the BLM and/or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
- Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (see Connelly et al. 2000).
- Where applicable, incorporate roads and natural fuel breaks into fuel break design.
- Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.

- Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior, and reduce the risk and rate of fire spread to key and restoration habitats
- Give priority for implementing specific sage-grouse habitat restoration projects in annual
  grasslands first to sites that are adjacent to or surrounded by sage-grouse key habitats. Annual
  grasslands are second priority for restoration when the sites not adjacent to key habitat, but within
  2 miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites
  beyond 2 miles of key habitat. The intent is to focus restoration outward from existing, intact
  habitat.
- As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
- Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
- Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks
  and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch
  sites for avian predators, as appropriate, and resources permit.
- Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
- Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road ROWs.
- Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

## Fire Management Best Management Practices

- Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.
- Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
- Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse
  habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on
  wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of
  qualified individuals.
- On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
- During periods of multiple fires, ensure line officers are involved in setting priorities.
- To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized.
- These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
- Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
- Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
- Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
- As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

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# **Appendix O**

# **BLM Lands with Wilderness Characteristics**

# **BLM LANDS WITH WILDERNESS CHARACTERISTICS**

# Introduction

In addition to the initial wilderness review required by Section 603 of the Federal Land Policy and Management Act of 1976 (FLMPA) that led to the creation of wilderness study areas (WSAs), the Secretary of the Interior is also required to "maintain on a continuing basis an inventory of all public lands and their resource and other values," which encompasses wilderness characteristics as a resource (FLPMA, Section 201).

In July 2011 the Bureau of Land Management (BLM) Director reaffirmed this responsibility via Instruction Memorandum (IM) No. 2011-154, which directed field units to review and update their inventory of lands for their wilderness characteristics and established a uniform protocol for doing so. The same IM emphasized that such an inventory "shall not, of itself, change or prevent change of the management or use of the lands." Rather, the findings of the inventory are to be considered among all other resource values and potential resource uses during the land use planning process. BLM Manual 6310 was released after IM No. 2011-154 and contains official agency direction for conducting inventory of wilderness characteristics. This inventory was initiated prior to publication of BLM Manual 6310, but completed after release of the manual. Therefore, the inventory was done in accordance with IM No. 2011-154 and BLM Manual 6310.

Lands with wilderness characteristics can generally be defined as unroaded BLM public land areas greater than 5,000 acres in size that have maintained their primitive character and are primarily undeveloped. The inventory of lands with wilderness characteristics further includes unroaded areas of any size adjacent to existing WSAs. BLM Manual 6310 also establishes a protocol for defining "roads" for the purposes of this inventory.

The BLM received a "citizens' wilderness proposal" from the San Juan Citizens Alliance in 2001 (and an updated version in 2008) containing wilderness characteristic inventory information for four areas on the Tres Rios Field Office (TRFO) (Weber-Menefee, Lower Dolores River Canyon, McKenna Peak, and Snaggletooth) and proposed that these areas be managed for their wilderness characteristics. These areas were considered and given special attention in the inventory process described below.

# **Background and Methodology**

A preliminary geographic information system (GIS) analysis was conducted that isolated areas with no inventoried (GIS cataloged) roads and that were greater than 5,000 acres in size. Per IM No. 2011-154, areas of any size adjacent to existing WSAs or designated wilderness were also identified. The GIS analysis revealed a total of 20 land units totaling 109,484 acres on the TRFO, which were prioritized for further analysis. As needed, the "wilderness inventory road" protocol was employed to verify the "unroaded" status of the various inventory units.

Staff then conducted an office exercise that identified other lands uses, resource development, use restrictions, or any other issues that may conflict with or enhance the potential for protection of wilderness values. Field visits were then conducted to many of the areas, which included a narrative and photo report. Following the criteria provided in IM No. 2011-154, a determination was made as to whether each unit did or did not have wilderness characteristics. Table O-1 shows the 20 analysis units and the determination of wilderness characteristics per unit.

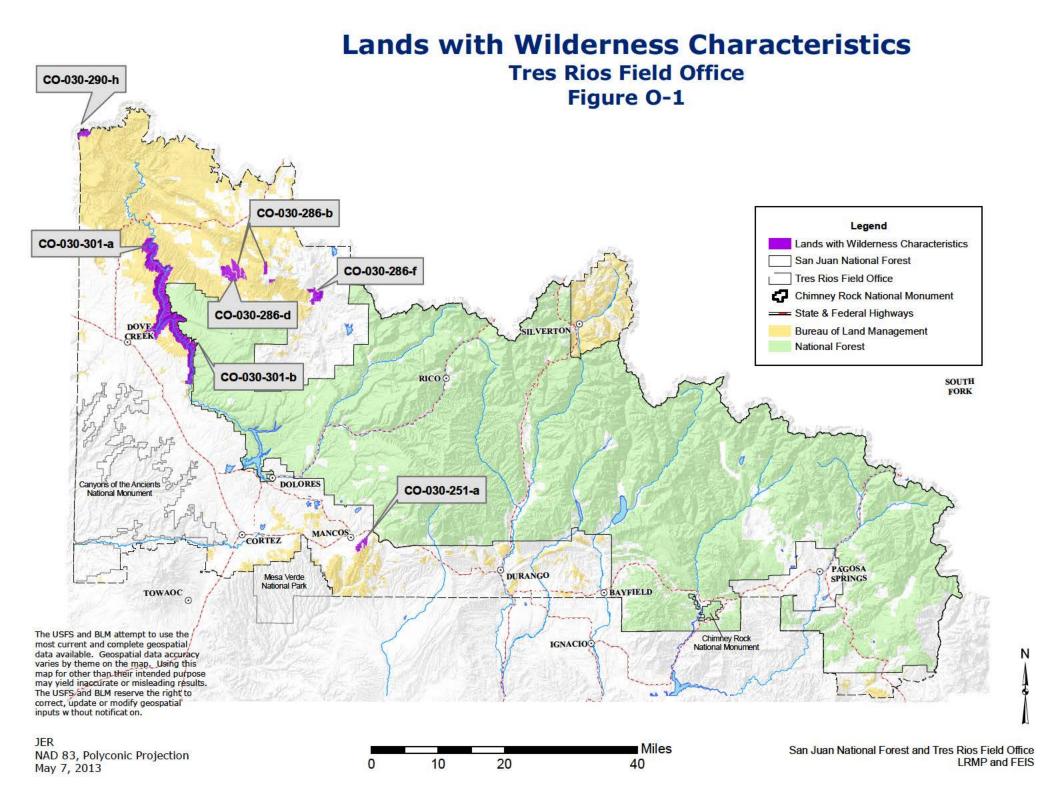
Table O.1: Lands with Wilderness Characteristics Inventory

Weber/Menefee	1	CO-030-251-a	1,157	Yes
	2	CO-030-251-b	5,162	No
	3	CO-030-252-a	355	No
McKenna Peak	4	CO-030-286-a	3,883	No
	5	CO-030-286-b	2,635	Yes
	6	CO-030-286-c	542	No
	7	CO-030-286-d	2,385	Yes
	8	CO-030-286-f	1,578	Yes
Snaggletooth	9a	CO-030-301a	10,144	Yes
	9b	CO-030-301-b	19,518	Yes
<b>Lower Dolores River</b>	10	CO-030-290-a	5,806	No
	11	CO-030-290-b	8,096	No
	12	CO-030-290-c	7,361	No
	13	CO-030-290-d	5,440	No
	14	СО-030-290-е	5,484	No
	15	CO-030-290-f	6,597	No
	16	CO-030-290-g	6,300	No
	17	CO-030-290-h	3,115	Yes
Silverton	18	CO-030-302-a	3,959	No
	19	CO-030-302-b	9,967	No
Totals		20 units	109,484	Yes = 7 units (40,532 acres)
			acres	No = 13 units (68,952 acres)

Larger-scale area maps and detailed descriptions of the various units of lands with wilderness characteristics can be found in the wilderness characteristics permanent documentation files at the TRFO and in the citizen's wilderness proposal received from San Juan Citizens Alliance.

Of the 20 units originally identified, seven units totaling 40,532 acres were found to have wilderness characteristics following research and field evaluations. These seven units were carried forward into the Final Environmental Impact Statement (FEIS), and their wilderness characteristics are considered among other resource values as directed in IM No. 2011-154. The FEIS describes alternative management strategies for the various units and the anticipated environmental effects of each alternative. The seven inventory units found to have wilderness characteristics within the TRFO are shown on Figure O-1.

The citizens' wilderness proposal last submitted in 2008 by the San Juan Citizens Alliance was considered throughout the inventory of lands with wilderness characteristics and evaluation process. The four areas specified in the proposal (Weber-Menefee, Lower Dolores River Canyon, McKenna Peak, and Snaggletooth) were all either part (or all) of an existing WSA or were found by the agency to contain wilderness characteristics, largely coinciding with the citizens' wilderness inventory. Some areas of private and state lands were excluded during the agency evaluation due to lack of federal jurisdiction, and a few other boundary differences between the citizens' proposal and agency evaluation were noticeable but were not significant. The agency unit evaluation boundaries in some cases exceeded the acreage/geographic scope of the citizens' proposal, such as the Coyote Wash area immediately west of the existing Dolores River WSA and some of the units adjacent to the existing McKenna Peak WSA.



## **Unit Evaluations**

This section briefly describes each of the 20 inventory units and the subsequent finding for that unit. Detailed descriptions and the completed evaluation worksheets are archived in the permanent documentation files at the TRFO.

#### Weber/Menefee Area

<u>CO-030-251-a (1,157 acres):</u> This area is immediately north and adjacent to the existing Menefee Mountain WSA (CO-030-251). The area consists of a broad northeast-southwest-trending ridgeline with mixed conifer, pinyon-juniper woodland, and desert scrubland vegetation types.

The area is primarily natural in appearance with minimal evidence of human activity and development within the unit. Expansive views of the La Plata Mountains and the Mesa Verde Escarpment dominate from the area.

Finding: The area contains wilderness characteristics.

<u>CO-030-251-b (5,162 acres):</u> This unit straddles a northwest-southeast-trending ridgeline east of the existing Menefee Mountain WSA (CO-030-251). Area vegetation is primarily pinyon-juniper woodland and desert scrub with some pockets of mixed conifer on north slopes.

The area boundary is very irregular and several "necks" within the unit are less than 0.25 mile wide, a configuration that would make the unit's management and boundary marking impractical. The area's shape also restricts its ability to provide for primitive and unconfined recreation and solitude for visitors.

Public access is blocked almost entirely by private lands, and numerous private developments abut the area on both sides. A communication tower group dominates the area's northern skyline, which is accessed by a maintained road.

**Finding:** The area does not contain wilderness characteristics.

<u>CO-030-252-a (355 acres):</u> This unit is adjacent to the northern boundary of the Weber Mountain WSA (CO-030-252). Its size, configuration, and lack of public access preclude the availability of primitive and unconfined recreation and solitude. The area is only accessible from the existing WSA by scrambling down steep slopes and cliffs from the mesa top. The unit is surrounded by private lands, homes, and ranching developments to the north.

**Finding:** The area does not contain wilderness characteristics.

#### McKenna Peak Area

<u>CO-030-286-a (3,883 acres):</u> The analysis area lies south of the Disappointment Valley county road. The unit contains primarily pinyon-juniper vegetation, with some mixed timber on sheltered northern slopes. The dominant feature of the area is a sandstone escarpment that encloses several drainage basins.

After the original GIS analysis, it was determined that this area is not adjacent to the McKenna Peak WSA (CO-030-286) and that the county road was not included in the roadless analysis. The GIS analysis was therefore redone and the resulting unit was less than 5,000 acres and was dropped from further consideration.

**Finding:** The area does not contain wilderness characteristics.

<u>CO-030-286-b (2,635 acres):</u> This analysis unit actually consists of several sub-units, all adjacent to the existing McKenna Peak WSA (CO-030-286). The sub-units were considered as a whole as they had many similarities, including vegetation types, topography, and physical proximity.

The area consists primarily of desert scrub with some pinyon-juniper woodland in the higher elevations. The area is dominated by the McKenna Peak escarpment and is dissected by numerous arroyos interspersed with small mesas. The unit is part of the Spring Creek Wild Horse Herd Management Area. Several horses were present during the field visit.

Although several BLM roads are present between the sub-units, the area is wild and remote and contains opportunities for primitive and unconfined recreation and solitude.

**Finding:** The area contains wilderness characteristics.

<u>CO-030-286-c (542 acres):</u> This unit was also misidentified as adjacent to the existing McKenna Peak WSA (CO-030-286) due to the county road being inadvertently not included in the original roadless GIS analysis. The area was therefore dropped from further consideration due to its size (< 5,000 acres).

**Finding:** The area does not contain wilderness characteristics.

CO-030-286-d (2,385 acres): This unit is adjacent to the existing McKenna Peak WSA (CO-030-286). This unit was originally greater than 5,000 acres after the preliminary GIS roadless analysis, but once again the county road was inadvertently excluded. After including the county road, the unit was recalculated at 2,390 acres and, because of its adjacency to the existing WSA, was still eligible for further analysis.

The area consists primarily of desert scrub with some pinyon-juniper woodland in the higher elevations. The area is dominated by the McKenna Peak escarpment and is dissected by numerous arroyos interspersed with small mesas. The unit is part of the Spring Creek Wild Horse Herd Management Area. Some stock developments are present near the county road, which are accessible by vehicle on roadways.

Although adjacent to the county road, the lack of traffic and human presence allows for solitude and primitive and unconfined recreation within the area.

Finding: The area contains wilderness characteristics.

<u>CO-030-286-f (1,578 acres):</u> This unit lies north of the Disappointment Valley county road and is adjacent to private property on the west side. The area consists of desert scrub, pinyon-juniper woodland, and some small pockets of timber on northerly slopes.

The steep and rugged terrain of the unit lends itself to solitude and primitive and unconfined forms of recreation. The area is undeveloped and primitive in nature, and motor vehicle restrictions have led to natural rehabilitation of two-track routes leading into the area.

Finding: The area contains wilderness characteristics.

## **Snaggletooth Area**

<u>CO-030-301a (10,144 acres):</u> This unit contains BLM lands west of the county road through the bottom of the canyon (County Road 14 F in San Miguel County and County Road 10 in Dolores County) from the road up to the canyon rim.

The area is a rugged, primarily undeveloped sandstone canyon country. The area consists of the largest unprotected and undeveloped contiguous BLM lands within the TRFO. Some large ponderosa pine and riparian cottonwood groves are found along the river, but the upland areas are primarily dry

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desert vegetation types. The river corridor is heavily used by river runners during infrequent water releases from McPhee Reservoir. Some motorized traffic and access occurs along the county road through the canyon bottom area.

The topography and rugged inaccessibility of upland areas lend themselves to primitive and unconfined types of recreation and solitude.

**Finding:** The area contains wilderness characteristics.

<u>CO-030-301b (19,518 acres):</u> This unit contains BLM lands generally from rim to rim of the Dolores River between Bradfield Bridge and Mountain Sheep Point. Downriver from Mountain Sheep Point, County Road 10 forms the western boundary of the unit and the canyon rim continues to form the eastern boundary.

The area is a rugged, primarily undeveloped sandstone canyon country. The area consists of the largest unprotected and undeveloped contiguous BLM lands within the TRFO. Some large ponderosa pine and riparian cottonwood groves are found along the river, but the upland areas are primarily dry desert vegetation types. The river corridor is heavily used by river runners during infrequent water releases from McPhee Reservoir. Some motorized traffic and access occurs along the county road through the canyon bottom area.

The topography and rugged inaccessibility of upland areas lend themselves to primitive and unconfined types of recreation and solitude.

The unit contains an existing right-of-way (100 feet wide) for an 115kv powerline. This right-of-way bisects the unit, but because it spans the canyon high above the canyon bottom, and maintenance of the right-of-way would not create new ground disturbance, the right-of-way was not used as a boundary to the unit.

Finding: The area contains wilderness characteristics.

## **Lower Dolores River Area**

<u>CO-030-290-a (5,806 acres):</u> Although it exceeds 5,000 acres in overall area, this unit, located in the Big Gypsum Valley, has an extremely convoluted boundary, private land in-holdings, and adjacent private parcels, all of which are characteristics that preclude effective boundary and protective management. The unit exhibits a desert environment with little screening or cover and also lacks topographical screening.

Evidence of other human activities on adjacent private land (or in-holdings) is evident from within the unit. The unit lacks naturalness, opportunities for primitive and unconfined recreation, and opportunities for solitude.

**Finding:** The area does not contain wilderness characteristics.

<u>CO-030-290-b (8,096 acres):</u> This unit is straddles the lower portion of Disappointment Valley and has significant in-holdings and a convoluted boundary. The unit has low relief and is primary desert scrubland.

The area is leased for fluid mineral (energy) development and has been developed for minerals, oil, and gas to a moderate degree in the past. It is expected to be more fully developed over the life of the Land and Resource Management Plan (LRMP). Sights and sounds of human activity are often detectable within the unit, detracting from the opportunity for primitive and unconfined recreation and solitude within the area.

**Finding:** The area does not contain wilderness characteristics.

**CO-030-290-c (7,361 acres):** This unit is composed of desert mesas and canyons, and exhibits the typical pinyon-juniper and desert scrubland vegetation expected in such areas. Although the area exceeds the 5,000-acre minimum criteria under agency direction, the shape of the area and a narrow "neck" in the center of the unit make it difficult to manage for primitive values.

The area is leased for fluid mineral (energy) development. Old roads (primarily not inventoried) and other sign of uranium mining (and other extractive) activities are prevalent within the unit, reducing opportunities for primitive and unconfined recreation and solitude.

The area has been explored and mined for various minerals in the past, including uranium. The area is currently leased for fluid mineral energy resources and is expected to be developed to some degree during the life of the LRMP.

**Finding:** The area does not contain wilderness characteristics.

<u>CO-030-290-d (5,440 acres):</u> This unit is again typical of sandstone river canyon country with mesas divided by canyons and primarily pinyon-juniper and desert scrubland vegetation. Four "necks" of roadless area less than 0.25 mile wide nearly divide this unit into four much smaller units.

The area is leased for fluid mineral (energy) development. An extensive road network, convoluted boundary, and interspersed private lands make this a difficult unit to manage. Evidence of past and present mining and other extractive industries are prevalent.

Sights and sounds of human activity are often encountered within the unit, detracting from opportunities for primitive and unconfined recreation and solitude.

Finding: The area does not contain wilderness characteristics.

<u>CO-030-290-e (5,484 acres):</u> This unit is primarily desert sandstone canyon country of McIntyre Canyon to the north of Horse Range Mesa. Typical vegetation is pinyon-juniper and desert scrubland.

The area is leased for fluid mineral (energy) development. Signs of past mining and other extractive activities are prevalent within the area. The area is nearly cut in two by a narrow "neck" of less than 0.25 mile. An aircraft landing strip is partially located within the unit.

Opportunities for primitive and unconfined recreation are limited by the area's configuration and proximity to developments. The area's lack of vegetative and topographic screening reduces opportunities for solitude.

Finding: The area does not contain wilderness characteristics.

<u>CO-030-290-f (6,597 acres):</u> This unit is composed primarily of a broad sandstone canyon, while the western part of the unit is the highlands of Island Mesa. Typical vegetation is desert scrubland and pinyon-juniper.

The area is leased for fluid mineral (energy) development. The area has significant signs of past mining and other extractive activities. Landing strips are present immediately west of the unit on Island Mesa. The area therefore lacks the overall appearance of naturalness.

Opportunities for primitive and unconfined recreation are limited within the area. Solitude can be found due to the steep topography.

**Finding:** The area does not contain wilderness characteristics.

<u>CO-030-290-g (6,300 acres):</u> This unit is primarily sandstone canyons and mesas with typical desert scrub and pinyon-juniper vegetation types. Steep topography falls off into the Silvey's Pocket area, a long-developed center of mining and grazing activities.

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The area is leased for fluid mineral (energy) development. Sights and sounds of human developments such as roads, ranching, and mining are prevalent within the area, detracting from opportunities for primitive and unconfined recreation and solitude.

Finding: The area does not contain wilderness characteristics.

<u>CO-030-290-h (3,115 acres):</u> This unit is composed of two sub-units separated by a roadway along the canyon bottom. The unit comprises the upper end of Coyote Wash, a significant tributary canyon of the Dolores River Canyon, which shares many of the characteristics of the larger canyon. Both sub-units are adjacent to the existing Dolores River Canyon WSA (CO-030-290).

The area is rich in opportunities for primitive and unconfined recreation and its topographic screening also allows for solitude within the unit. River users often use Coyote Wash as a hiking side-trip due to its unique features and remoteness.

The area is manageable for protecting wilderness values due to its steep topography, lack of roads and other developments, and it has not been subject to significant extractive industry activities.

**Finding:** The area contains wilderness characteristics.

### Silverton Area

<u>CO-030-302-a (3,959 acres):</u> This area is located east and south of Animas Forks adjacent to the Handies' Peak WSA, which is managed by the BLM Gunnison Field Office. Although a small northern portion is actually contiguous with Handies' Peak, in reality the bulk of the area is convoluted and narrow in shape, trending away from Handies' Peak. It is therefore not really manageable in conjunction with the Handies' Peak WSA, and it also has adjacent private lands, patented and developed mining claims, and narrow "necks" of roadless area that detract from its naturalness and manageability as a protected area.

Although primitive and unconfined recreation opportunities exist, they cannot be considered outstanding when compared to those found nearby in the San Juan Mountains. Solitude is limited within the area due to private developments, mining activities, and the narrow and convoluted shape of the unit.

Finding: The area does not contain wilderness characteristics.

<u>CO-030-302-b (9,967 acres):</u> This unit comprises the precipitous mountain area north of Silverton between the Cement Creek and Animas River drainages. Although relatively large in acreage, this unit has several factors that detract from its naturalness and manageability as a protected area. About 13,000 acres of adjacent and/or overlapping land area is permitted by the BLM for the operation of the Silverton Mountain ski area. Developed ski areas are typically incompatible with management of wilderness values and the permit authorizes actions inconsistent with protection of wilderness values.

Patented mining claims are found throughout the unit and adjacent to it. Reasonable access to these private lands is provided by law, which is typically by vehicles on developed roadways.

Steep mountain topography limits opportunities for development of any kind within this area.

Finding: The area does not contain wilderness characteristics.

## Land and Resource Management Plan Alternatives for Lands with Wilderness Characteristics

Almost all of the lands within all seven units that were found to have wilderness characteristics during the wilderness characteristics inventory, with the exception of 3,958 acres, are considered to be managed for their wilderness characteristics in the LRMP alternatives. Alternative C places an emphasis on maintenance of undeveloped and protected areas and therefore proposes that all seven units containing wilderness characteristics be managed for their wilderness characteristics to maximize protection of undeveloped lands. Alternative D, with its emphasis on multiple forms of access and resource use, does not propose management of any lands for their wilderness characteristics. Alternative B offers a balance between these alternatives and proposes that two areas, totaling 11,867 acres, be managed for their wilderness characteristics (portions of units CO-030-290h and CO-030-301b). The rationale for including specific units within Alternatives B and C is provided below.

**Unit Co-030-251a**: The unit is technically adjacent to WSA (CO-030-251, Menefee Mountain) and is, to a large degree, separated from the adjacent WSA by a maintained road which accesses a communication site that dominates the skyline. The unit wraps around two private land inholdings (with housing developments) and a State managed Section and stair-steps around private lands on the northern boundary. While the combination of adjacent impacts (the maintained road, communication tower, and private land developments) and irregular shape (at times less than 1/8 of a mile wide) do not preclude management of the unit for inventoried wilderness characteristics, these impacts are pervasive and omnipresent and would make management for those characteristics significantly challenging. Thus under the preferred alternative, BLM proposes not to manage this unit for its inventoried wilderness characteristics, and to emphasize ongoing management of the unit for other resources and activities. Lands in this unit would be managed for their wilderness characteristics in Alternative C.

**Unit Co-030-286b**: This unit is adjacent to a WSA (Co-030-286, McKenna Peak). The majority of the acreage falls within the Spring Creek Herd Management Area, creating management conflict concerns, while also affording some protective management of the landscape. These considerations resulted in the proposal to not manage this unit for its wilderness characteristics under the preferred alternative and to emphasize management of the herd area instead. Lands in this unit would be managed for their wilderness characteristics in Alternative C.

**Unit Co-030-286d**: This unit projects from the adjacent WSA (Co-030-286, McKenna Peak). The unit falls within the Spring Creek Herd Management Area, creating management conflict concerns, while also affording some protective management of the landscape. These considerations resulted in the proposal to not manage this unit for its wilderness characteristics under the preferred alternative and to emphasize management of the herd area instead. Lands in this unit would be managed for their wilderness characteristics in Alternative C.

**Unit Co-030-286f**: This unit is technically adjacent to WSA Co-030-286 (McKenna Peak), though the connection is a very narrow strip of land in the northwest corner of the unit. A stock pond is located 1.5 miles into the unit. While not in and of itself 'substantially noticeable', it is accessed via a route (BLM Road 4741) determined to be a 'wilderness inventory road' through a route analysis (completed on 10/2/2012). This road nearly completely bisects the unit, results in narrow (1/3-1/2 mile wide) and irregular unit configuration. While not precluding management of the unit for inventoried wilderness characteristics, it makes management for those characteristics significantly challenging. Thus under the preferred alternative, BLM proposes not to manage this unit for its inventoried wilderness characteristics, and to emphasize ongoing management of the unit for other resources and activities. Lands in this unit would be managed for their wilderness characteristics in Alternative C.

**Unit Co-030-290h**: This unit forms a natural extension of the Lower Dolores River WSA (Co-030-290). While there is an unimproved, primitive road which runs down the bottom of the canyon, there

is no legal access to the route either from the eastern (Utah) end of the wash, nor from the western end of the wash (Lower Dolores River WSA). The full inventoried area consists of 3,115 acres, and 1,144 acres are proposed to be managed for wilderness characteristics in Alternative B. The portion of the unit located between the rims of the canyon feature is proposed for management for the inventoried wilderness characteristics present within the unit in Alternatives B and C.

**Unit Co-030-301a**: This unit is a long and narrow, comprised mostly of vertical cliff features on the west and a County Road (CR 14F/10) in the canyon bottom along the east. Motorized use along the county road can be very heavy at times (such as during periods of boatable water on the Dolores River). External impacts are seasonally pervasive and omnipresent. The presence of the road makes it difficult for the BLM to ensure outstanding opportunities for solitude into the future over the life of the plan, based on present knowledge of the resources, ongoing uses, and valid existing rights in the area. The road and its use do not preclude management of the unit for inventoried wilderness characteristics, but makes management for those characteristics significantly challenging. Thus under the preferred alternative, BLM proposes not to manage this unit for its inventoried wilderness characteristics, and to emphasize ongoing management of the unit for other resources and activities. About 9,123 acres in this unit would be managed for their wilderness characteristics in Alternative C, which does not include about 931 acres above the canyon rim.

Unit Co-030-301b: The northern portion of this unit is long and narrow, comprised mostly of vertical cliff features on the east and a boundary County Road (CR 14F/10) on the west in the canyon bottom along the west. Motorized use along the County Road can be very heavy at times (such as during the boating season on the Dolores River). External impacts are seasonally pervasive and omnipresent. The presence of the County Road jurisdiction makes it difficult for the BLM to ensure outstanding opportunities for solitude into the future over the life of the plan, based on present knowledge of the resources, ongoing uses, lack of control of level of the County Road improvements into the future, and valid existing rights in the area. The road and its use do not preclude management of the northern portion of the unit for inventoried wilderness characteristics, but makes management for those characteristics significantly challenging. Thus under the preferred alternative, BLM proposes not to manage this northern portion of the unit for its inventoried wilderness characteristics, and to emphasize ongoing management of the unit for other resources and activities. The majority of the remaining lands in this area would be managed for their wilderness characteristics in Alternative C, with the exception of 1,598 acres.

The southern portion of the unit (rim to rim between Bradfield Recreation Site and Mt. Sheep Point) is not encumbered by the effects of the County Road nor existing routes along the canyon rim, and is proposed for management for the wilderness characteristics present in this portion of the unit under alternatives B and C.

# Appendix P Federally Listed Species and Sensitive Species

## 1 INTRODUCTION

U.S. Forest Service (USFS) and Bureau of Land Management (BLM) management activities promote the continued conservation of federally listed species and USFS or BLM identified sensitive species and the habitats on which they depend. The tables below display 1) federally listed plant, wildlife, and fish species (USFS and BLM) followed by USFS sensitive species, 2) and BLM sensitive species. Sensitive fish species (BLM and USFS) are combined in the last table. An evaluation of sensitive species is located in Appendix T.

## 2 FEDERALLY LISTED SPECIES AND THEIR HABITAT

Table P.1: Federally Listed Plant Species and Critical Habitat on the San Juan National Forest and Tres Rios Field Office

Plant Species	Status	Habitat Group
Pagosa skyrocket	Endangered with designated	Mancos shale soils in mountain grasslands,
(Ipomopsis polyantha)	Critical Habitat	mountain shrublands, and ponderosa pine stands
Knowlton's cactus	Endangarad	Rolling, gravelly hillsides in pinyon-juniper
(Pediocactus knowltonii)	Endangered	woodlands
Mesa Verde cactus	Threatened	Sparsely vegetated badlands of the Fruitland and
(Sclerocactus mesae-verde)	Tilleatened	Mancos Shale formations
Schmoll's milkvetch	Candidate	Danga ninyan iyninar waadlanda
(Astragalus schmolliae)	Candidate	Dense pinyon-juniper woodlands

## **Notes to Table P.1**

There is one known population of *Pagosa skyrocket* on the TRFO. There are no known populations on the SJNF, but there is suitable habitat on the SJNF. The USFWS has designated four Critical Habitat Units for Pagosa skyrocket; two are occupied, and two are unoccupied. One of the occupied Critical Habitat Units is on TRFO land. The two unoccupied Critical Habitat Units occur on SJNF lands.

There are no known populations of *Knowlton's cactus* on the SJPL but there is suitable habitat on both SJNF and TRFO lands in Archuleta and La Plata Counties, Colorado.

There are no known populations of *Mesa Verde cactus* or *Schmoll's milkvetch* on the SJNF or TRFO, but there is suitable habitat for these species on the TRFO.

Table P.2: Federally Listed Terrestrial Wildlife Species on the San Juan National Forest and Tres Rios Field Office

Terrestrial Wildlife Species	Status	Habitat Group
Canada lynx ( <i>Lynx Canadensis</i> )	Threatened	High-elevation conifer
Uncompange fritillary butterfly (Boloria acrocnema)	Endangered	Alpine
Southwestern willow flycatcher (Empidonax traillii extimus)	Endangered	Riparian
Mexican spotted owl (Strix occidentalis lucida)	Threatened	Douglas-fir, ponderosa pine
Gunnison sage-grouse (Centrocercus minimus)	Proposed Endangered with Proposed Critical Habitat	Sagebrush shrublands
North American wolverine ( <i>Gulo gulo</i> )	Proposed Threatened	Alpine, and subalpine forests

### **Notes to Table P.2**

In March 2000, the *Canada lynx* was listed as a federally threatened species under the ESA. In March 2009, the USFWS revised the critical habitat designated for lynx to include approximately 39,000 square miles encompassing five critical habitat units in Maine, Minnesota, Montana, Wyoming, Idaho, and Washington.

The planning area represents the southern edge of the historic range of the Canada lynx. Individual lynx, or population groups, have been extremely rare or absent within the planning area and across Colorado since the early 1900s. In 1999, the CPW initiated a lynx recovery program intended to augment any existing populations in the southern Rocky Mountains with transplants from Canada and Alaska. The augmentation program resulted in 218 lynx being transplanted into the San Juan Mountains between 1999 and 2006. Habitat on USFS and BLM lands within the planning area have contributed to the reintroduction effort and are considered part of a core area that is important to recovery of lynx in Colorado. From February 1999 to February 2005, 144 of the reintroduced lynx were detected in the planning area and 126 kittens were born in Colorado as of June 2009.

In the southern Rocky Mountains, high-elevation spruce-fir forests make up the primary habitat for lynx and its primary prey species, the snowshoe hare. There are approximately 777,000 acres of lynx habitat on NFS lands and approximately 15,000 acres of lynx habitat on BLM lands in the planning area.

Currently, there is no federal recovery plan published for this species. NFS lands are managed under the guiding requirements of the SRLA and LCAS (Ruediger et al. 2000, revised in 2006 [USFS and USFWS 2006]). On BLM lands, Canada lynx habitat is managed according to the Canada Lynx Conservation Agreement, which was signed by the USFS, BLM, and USFWS in the spring of 2000 (USFS and USFWS 2000). Under that agreement, the land management agencies agreed to consider the recommendations contained in the LCAS in order to help guide planning activities and ESA Section 7 consultation. These guiding documents include habitat definitions, recommended analysis methods, and conservation measures, goals, objectives, standards, and guidelines intended to help provide a consistent approach to conserve Canada lynx in the conterminous United States.

The *Mexican spotted owl* is one of three subspecies of spotted owl in North America. In March 1993, the Mexican subspecies was listed as a federally threatened species under the ESA. The proposed rule to designate critical habitat for the Mexican spotted owl was completed by the USFWS in February 2001. That proposal included 4.6 million acres across Colorado, Utah, Arizona, and New Mexico. The 2001 proposal was considered inadequate by the courts in October 2003, and a new final rule to designate critical habitat was published in August 2004. The 2004 rule included 8.6 million acres across federal lands in Colorado, Utah, Arizona, and New Mexico. Approximately 322,326 acres (approximately 3.7%) of this land occurs in Colorado. The planning area was not included in the 2001 or the 2004 critical habitat designations.

There have been numerous Mexican spotted owl surveys conducted across the SJNF and TRFO since the late 1980s. To date, protocol surveys have detected only three Mexican spotted owls on NFS lands (two juvenile females and one juvenile male). These detections occurred during separate years in the southeastern portion of the planning area. These detections may represent individuals that occasionally disperse and/or move to and from more suitable habitat to the south. There have been no Mexican spotted owl detections on BLM lands in the planning area. Nesting has been documented in Mesa Verde National Park, but no owls have been located outside the park on adjacent BLM-administered or NFS lands. The occurrence of Mexican spotted owl within the planning area appears to be irregular and uncommon, and similar to other locations in Colorado where apparently suitable habitat remains unoccupied.

Mexican spotted owl habitat was mapped across the planning area in 1992. A total of 67,324 acres of habitat in 31 locations were mapped along the southern boundary of the planning area. These areas represent approximately 2% of the total acreage in the planning area. Habitat for Mexican spotted owl would be re-evaluated as the current Mexican Spotted Owl Recovery Plan (USFWS 1995) is updated and available (USFWS 2012c).

Mexican spotted owl habitat in the planning area occurs mostly in steep, narrow, rocky canyons that are rarely subject to management activities; therefore, habitat has been minimally affected by management actions. Habitat present across most areas has been influenced by insects, disease, and wildfire. These disturbance processes have reduced habitat quality over the last 20 years. Management activities (mechanical fuels reduction, prescribed fire, forest restoration projects) have been completed in some locations to help restore habitat conditions and reduce the risk of catastrophic wildfire. Management of Mexican spotted owl habitat across the planning area has been consistent with the current recovery plan, and would continue as that recovery plan is updated. Continued inventory and monitoring of suitable habitat and maintenance of occupied habitat would be the primary conservation measures that the SJNF and TRFO would use in order to aid in the recovery of the species.

The **Southwestern willow flycatcher** is one of four or five recognized subspecies of the willow flycatcher (Sedgwick 2001). In March 1995, the southwestern willow flycatcher was listed as a federally endangered species under the ESA. The proposed rule to designate critical habitat for the southwestern willow flycatcher was completed in October 2004. The proposal included 1,556 floodplain miles in California, Arizona, Nevada, Utah, Colorado, and New Mexico as critical habitat within the 100-year floodplain or flood-prone areas. The proposal also identified the essential stream and lake edge habitats thought to be essential for conserving the species (USFWS 2004). There is no designated critical habitat for the southwestern willow flycatcher in the planning area.

The current survey information indicates that southwestern willow flycatchers are localized and uncommon on the SJNF. There are no confirmed breeding populations of southwestern willow flycatcher in the planning area. Increasing trends in overall riparian habitat conditions suggest that ample unoccupied habitat is available if the subspecies eventually begins nesting within the planning area.

In summary, the current information suggests that the planning area does not measurably contribute to the recovery or overall viability of the southwestern willow flycatcher. The possibility of future individual breeding pairs, however, cannot be discounted as the recovery of the subspecies expands. Continued monitoring of suitable and occupied habitats would continue to utilize the USFWS protocol. Management of southwestern willow flycatcher habitat across the planning area has been consistent with the current Southwestern Willow Flycatcher Recovery Plan (USFWS 2002) and would continue as the recovery plan is updated. Continued inventory and monitoring of suitable habitat and maintenance of occupied habitats would occur in order to aid in the recovery of the species.

The *Uncompahgre fritillary butterfly* was discovered in 1978 and described as a new species in 1980. In 1991, it was listed as a federally endangered species. The Uncompahgre fritillary butterfly has the smallest range of any North American butterfly and is restricted to alpine, snow willow habitats within a small geographical area in the San Juan Mountains and southern Sawatch Range in southwest Colorado. Suitable habitat in the planning area occurs on both BLM-administered and NFS lands.

Suitable habitat for the Uncompander fritillary butterfly is restricted to topographic features that rarely occur in the planning area. Suitable habitat consists of snow willow above 13,000 feet on north, northeast, and east aspects. Snow willow serves as the host plant for the eggs and larvae of the Uncompander fritillary butterfly. Most of the snow willow patches in the planning area do not support the vegetative characteristics of occupied sites found on neighboring forests (may be related to soil and moisture factors).

Since 1983, the number of known Uncompahgre fritillary butterfly colonies across the species range has increased (as more extensive surveys have been initiated). Currently, the species is known, or suspected, to occur at 12 sites, all of which contain various numbers of population clusters. After at least 9 years of intensive inventory, all probable locations for finding additional Uncompahgre fritillary butterfly colonies are nearly exhausted. There are no additional priority sites to survey within the planning area that may possibly support the species (although one additional site on SJNF land is considered a possibility, if snow willow characteristics are adequate).

The Uncompander fritillary butterfly was not known to occur in the planning area until 2004, when a small habitat patch associated with an existing colony was discovered on SJNF lands. There are no threats

identified for this colony (due to its remoteness), and habitat has remained stable. Current monitoring shows the population is persistent, and the entire colony currently remains one of the most extensive of the known populations (Ellingson 2003).

Currently, there are enough known colonies of sufficient size to down-list the Uncompangre fritillary butterfly. However, the down-listing criteria calls for 10 stable colonies for a period of 10 years, and not enough colonies have been known for the time specified. There is also a need for more long-term monitoring in order to determine population changes over time. Due to their seclusion, there are few, if any, immediate risks or management issues associated with the colonies. Continued monitoring and confidentiality of colony locations are the primary conservation measures pursued for the species.

The **Gunnison sage-grouse** is proposed for listing as endangered under the ESA, and critical habitat has been proposed in the planning area.

Gunnison sage-grouse currently occupy a small fraction of their historical range and have been extirpated from much of their presumed historical distribution due to habitat conversion (Gunnison Sage-grouse Rangewide Steering Committee 2005). Although their distribution was probably always somewhat fragmented, the amount of fragmentation has greatly increased due to habitat loss. As of 2004, the total population of this species was estimated at approximately 3,200 breeding birds in seven populations (75% of which occurred in the Gunnison Basin). In 2011 CPW estimated Gunnison sage-grouse populations to be 4,155 breeding birds. The Gunnison sage-grouse remains a species of conservation interest in this planning process because two small populations (Dove Creek and San Miguel) occur on lands administered by the TRFO and because of continued habitat and population viability concerns. The Dove Creek and San Miguel populations are not thought to contribute to the overall viability of Gunnison sage-grouse range wide. Dove Creek supports 1.4% of the total Gunnison sage-grouse population and San Miguel supports 2.2% of the total population.

There are many threats and challenges associated with the management and continued persistence of Gunnison sage-grouse. The primary threat, however, is the permanent loss, and the associated fragmentation, of sagebrush (Gunnison Sage-grouse Rangewide Steering Committee 2005). These threats are amplified by land ownership patterns, especially where the risk of urban expansion and/or habitat conversion is high. Currently, the majority of the occupied habitat occurs on private land; therefore, the amount of conservation benefit provided by lands administered by the TRFO would be minimal for these subpopulations. In the Dove Creek area (41,284 acres), for example, private lands make up roughly 79% of the proposed occupied critical habitat, while BLM lands account for approximately 21%. The amount of TRFO-administered lands is even smaller for the Miramonte subpopulation, which covers approximately 6,782 acres of proposed occupied critical habitat (where BLM lands make up approximately 41% of the proposed occupied critical habitat). In the Dry Creek area proposed occupied critical habitat is approximately 61,823 acres; however, most (approximately 57%) of the occupied habitat occurs on BLM lands; therefore, the TRFO may have more of a management influence on the Dry Creek subpopulation. There is at least one known lek on BLM lands in the Dry Creek Basin. It is possible that leks in the basin exist that have not been identified. Lek sites do occur on adjacent private and state lands, and the habitats on BLM lands are important in providing nesting and brood-rearing habitat in conjunction with those lek sites.

In 2005, the Gunnison Sage-grouse Rangewide Conservation Plan (Gunnison Sage-grouse Rangewide Steering Committee 2005) was completed in order to supplement information in the local conservation plans and provide a range-wide perspective regarding the conservation of Gunnison sage-grouse. Conservation efforts for the Gunnison sage-grouse within the planning area would continue through the opportunities identified in these plans and through local partnerships, as opportunities arise.

On February 4, 2013, the USFWS published a proposed rule to list the distinct population segment (DPS) of the *North American wolverine* occurring in the 48 contiguous United States as a threatened species under the ESA (USFWS 2013b). The proposed rule did not propose any critical habitat for the species. The primary reason for the proposed listing was threats to habitat from global climate change. There are numerous historical records of wolverines from the Colorado Rocky Mountains. However, the species is believed to have been extirpated from the southern Rocky Mountains including Colorado, New Mexico,

and Wyoming by the early 1900s. In May 2009 a radio-collared male wolverine was tracked from the Yellowstone ecosystem south into north-central Colorado, becoming the first confirmed wolverine occurrences in Colorado since 1919 (Inman et al. 2009).

Climate change has been projected to have the potential to reduce suitable wolverine habitat by 31% in the contiguous United States by the year 2045, and by 63% by 2099 (USFWS 2013b). Deep snow that persists into the month of May is essential for wolverine reproduction. Reproduction is the life-history parameter likely to be most sensitive to climate changes, but year-round wolverine habitat, not just denning habitat, is likely to be reduced due to the effects of climate change. Human activities, including dispersed recreation activities, infrastructure, and the presence of transportation corridors, occur in occupied wolverine habitat. The alpine and subalpine habitats preferred by wolverine, however, typically receive less human use than lower-elevation habitats. Land management activities such as timber harvest, prescribed fire, and silviculture can modify wolverine habitat, but this wide-ranging generalist species does not appear to be greatly affected by changes in vegetation. For these reasons, the USFWS (2013b) determined that "human activities and developments do not pose a current threat to wolverines in the contiguous United States" and forest management activities "would not significantly affect the conservation of the DPS."

The SJNF and TRFO are thought to provide a large amount of apparently suitable wolverine habitat, mostly in alpine and subalpine areas. Although the San Juan Mountains are at the southernmost extent of the known historic wolverine range (Aubry et al. 2007; USFWS 2013), the large area within the San Juan Mountains that is at relatively high elevation appears to provide an abundance of alpine habitats with late season snowfields that are central to wolverine ecology.

Table P.3: Federally Listed Aquatic Species on the San Juan National Forest and Tres Rios Field Office

Fish Species	Status	Habitat Group
Colorado pikeminnow (Ptchocheilus lucius)	Endangered	Aquatic
Razorback sucker (Xyrauchen texanus)	Endangered	Aquatic
Humpback chub (Gila cypha)	Endangered	Aquatic
Bonytail chub (Gila elegans)	Endangered	Aquatic
Greenback cutthroat trout (Oncohrynchus clarkia stomias)	Threatened	Aquatic

### **Notes to Table P.3**

Public land management activities that affect water depletions are implemented in compliance with the Section 7 Agreement and Recovery Implementation Program Action Plan (RIPRAP) (USFWS 1993) and San Juan Basin Recovery Implementation Program (USFWS 2003) for the four endangered fish species found in the Upper Colorado and San Juan river systems (Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub).

## **3 FOREST SERVICE SENSITIVE SPECIES**

Table P.4: U.S. Forest Service Rocky Mountain Region (R2) Sensitive Wildlife Species and their Habitat Associations on the San Juan National Forest

Sensitive Species	Habitat Association or Vegetation Type
Mammals (9)	
American marten Martes americana	Subalpine spruce-fir forests, alpine tundra, montane forests
Fringed myotis  Myotis thysanodes pahasapensis	Pinyon-juniper and other coniferous woodlands

Sensitive Species	Habitat Association or Vegetation Type
Gunnison's prairie dog	Grasslands and semidesert and montane shrublands
Cynomys gunnisoni	
Hoary bat	Associated with trees. In Colorado, it is mainly found in ponderosa pine,
Lasiurus cinerus	piñon/juniper, and riparian forest.
New Mexico meadow jumping mouse	Mesic grass/forb/sedge riparian habitat
Zapus hudsonius luteus	Niesie grass/1010/seuge riparian naoitat
River otter	Stream and river riparian
Lontra canadensis	
Rocky Mountain bighorn sheep	Steep, high mountain terrain dominated by grass, low shrubs, rock cover
Ovis canadensis canadensis	and areas near open escape
Spotted bat	Pinyon-juniper, shrub desert, possibly riparian
Euderma maculatum	Finyon-jumper, smuo desert, possiory riparran
Townsend's big-eared bat	Abandoned mines and caves
Corynorhinus townsendii	Abandoned mines and caves
Birds (18)	
American bald eagle	Forested stands around equatic settings
Haliaeetus americanus	Forested stands around aquatic settings
American bittern	Marsh, swamp, or bog with cattails, rushes, grasses, and sedges
Botaurus lentiginosus	ividish, swamp, of bog with cattains, rushes, grasses, and seuges
American peregrine falcon	Breeds on cliffs, often in association with riparian areas; regular breeder
Falco peregrinus anatum	SJNF administrative unit
Black swift	Vertical rook foods near waterfalls or in drinning cover
Cypseloides niger	Vertical rock faces near waterfalls or in dripping caves
Boreal owl	Mating annual for forests with high annual along
Aegolius funereus	Mature spruce-fir forests with high canopy closure
Brewer's sparrow	Primarily sagebrush but also in mixed shrublands (rabbitbrush, greasewood,
Spizella breweri	etc.)
Ferruginous hawk	Grasslands and semi-desert shrub; not known to breed but a regular winter
Buteo regalis	resident on SJNF administrative unit
Flammulated owl	Open ponderosa pine forests; dry montane conifer or aspen forests, often
Otus flammeolus	with dense saplings
Lewis' woodpecker	Open ponderosa pine forest, riparian, and pinyon-juniper woodlands
Melanerpes lewis	Open ponderosa pine forest, riparian, and pinyon-jumper woodiands
Loggerhead shrike	Lowland riparian, pinyon-juniper woodlands, semi-desert shrublands
Lanius ludovicianus	Lowiand riparian, phryon-jumper woodiands, semi-desert sin dotailds
Northern goshawk	Ponderosa pine, aspen, mixed-conifer, and spruce-fir forests
Accipiter gentiles	
Northern harrier	Grasslands, agricultural lands, mountain sagebrush, and marshes; requires
Circus cyaneus	abundant cover (same as for short-eared owl)
Olive-sided flycatcher	Snags and conifers, often on steep slopes, open stands, and natural openings
Contopus cooperi	onago and conners, orten on steep stopes, open stands, and natural openings
Purple martin	Mature aspen stands near streams, springs, or ponds
Progne subis	
Short-eared owl	Open habitats including grasslands, marsh edges, shrub-steppe, and
Asio flammeus	agricultural lands; requires taller grass cover than northern harrier
Western burrowing owl	Prairie dog colonies with vacant burrows; grasslands, shrublands, deserts
Athene cunicularia	Trune dog colonies with vacant outlows, grassiands, sin actuates, describ
Western yellow-billed cuckoo	Riparian; gallery cottonwoods with dense understory
Coccyzus americanus	Triputium, Suriery contoninoous with delise understory
White-tailed ptarmigan	Alpine tundra, especially with rock fields and willow carrs
Lagopus leucurus	Tipino tantatu, copociany with rock fields and willow carts

Sensitive Species	Habitat Association or Vegetation Type
Insects (1)	
Great Basin silverspot butterfly (Nokomis fritillary butterfly) Speyeria nokomis nokomis	Riparian; mostly tied to springs
Amphibians (2)	
Boreal toad Bufo boreas boreas	Damp conditions; marshes, wet meadows, streams, ponds, lakes
Northern leopard frog Rana pipiens	Water's edge; wet meadows, banks of marshes and ponds

Table P.5: U.S. Forest Service Rocky Mountain Region (R2) Sensitive Plant Species and their Habitat Associations on the San Juan National Forest

Sensitive Plant Species	Habitat Association or Veg Type
Stonecrop gilia Aliciella sedifolia	Alpine (dry, rocky gravelly talus of tuffacous sandstone)
Missouri milkvetch Astragalus missouriensis var. humistratus	Pinyon-juniper woodlands, ponderosa pine forests, Gambel oak shrublands (underlain by Mancos shale)
Aztec milkvetch Astragalus proximus	Ponderosa pine, pinyon-juniper, mountain shrubland
Lesser panicled sedge Carex diandra	Riparian/wetland (fens)
Lesser yellow lady's slipper orchid Cypripedium parviflorum	Aspen, ponderosa pine (restricted to calcareous derived soils in montane aspen and ponderosa pine forest)
Smith's draba Draba smithii	Mixed Conifer (montane seeps, rock cracks and crevices in shaded protected sites)
English sundew Drosera anglica	Riparian/wetland (fens)
Stream orchid Epipactis gigantea	Riparian/wetland (seeps on sandstone cliffs and hillsides)
whitebristle cottongrass <i>Eriophorum altaicum var. neogaeum</i>	Riparian/wetland (fens)
Chamisso's cottongrass <i>Eriophorum chamissonis</i>	Riparian/wetland (fens)
Slender cottongrass <i>Eriophorum gracile</i>	Riparian/wetland (fens, wet meadows)
Lone Mesa snakeweed Gutierrezia elegans	Pinyon-juniper, semi-desert shrubland, sagebrush (barren Mancos shale outcrops)
Frosty bladderpod Lesquerella pruinosa	Mountain grasslands and mountain shrublands (soils derived from Mancos shale)
Colorado tansyaster <i>Machaeranthera coloradoensis</i>	Alpine, spruce-fir (gravelly areas on slopes and in parks, on soils of sedimentary or volcanic origin)
Kotzebue's grass-of-Parnassus Parnassia kotzebuei	Sub-alpine and Alpine (wet areas along streamlets and in moss mats)
Cushion bladderpod  Physaria pulvinata	Pinyon-juniper, semi-desert shrubland, sagebrush (barren shale outcrops)
West silver bladderpod Physaria scrotiformis	Alpine (barren exposure of Leadville limestone)
Arizona willow Salix arizonica	Riparian/wetland (high elevation wet meadows, streamsides, and cienegas)

Sensitive Plant Species	Habitat Association or Veg Type
Sageleaf willow Salix candida	Riparian/wetland (fens)
Autumn willow Salix serrisima	Riparian/wetland (fens and possibly streambanks)
Sphagnum moss Sphagnum angustifolium	Riparian/wetland (fens)
Baltic bog moss Sphagnum balticum	Riparian/wetland (fens)
Largeflower triteleia Triteleia grandiflora	Ponderosa pine
Lesser bladderwort Utricularia minor	Aquatic (submerged in shallow water, inundated mudflats, or areas with emergent vegetation)

## **4 BLM SENSITIVE SPECIES**

**Table P.6: Bureau of Land Management Sensitive Wildlife Species and their Habitat Associations on the Tres Rios Field Office** 

Sensitive Species	Habitat Association or Vegetation Type
Birds	Habitat Association of Vegetation Type
American bald eagle Haliaeetus americanus	Forested stands around aquatic settings
American bittern Botaurus lentiginosus	Marsh, swamp, or bog with cattails, rushes, grasses, and sedges
American peregrine falcon Falco peregrinus anatum	Breeds on cliffs, often in association with riparian areas; regular breeder TRFO administrative unit
Black swift Cypseloides niger	Vertical rock faces near waterfalls or in dripping caves
Brewer's sparrow Spizella breweri	Primarily sagebrush but also in mixed shrublands (rabbitbrush, greasewood, etc.)
Columbian sharp-tailed grouse Pediocetes phasianellus columbianus	Oak/serviceberry shrublands, often interspersed with sagebrush; aspen forests; irrigated pasture; recently reintroduced near Dolores, not expected for other units
Ferruginous hawk Buteo regalis	Grasslands and semi-desert shrub; not known to breed but a regular winter resident on TRFO administrative unit
Gunnison Sage-grouse Centrocercus minimus	Sagebrush grasslands
Northern goshawk Accipiter gentiles	Ponderosa pine, aspen, mixed-conifer, and spruce-fir forests
Western burrowing owl <i>Athene cunicularia</i>	Prairie dog colonies with vacant burrows; grasslands, shrublands, deserts
Western yellow-billed cuckoo Coccyzus americanus	Riparian; gallery cottonwoods with dense understory
White-faced ibis Plegadis chihi	Fresh water marshes, pond edges, irrigated land.
Insects	
Great Basin silverspot butterfly (Nokomis fritillary butterfly) Speyeria Nokomis nokomis	Riparian; mostly tied to springs
Mammals	
Allen's big-eared bat	

Sensitive Species	Habitat Association or Vegetation Type	
Big free-tailed bat		
Desert bighorn sheep	Rocky canyons, grass, low shrub, open habitat with adjacent steep rocky	
Ovis Canadensis nelsoni	areas for escape and safety	
Fringed myotis	Pinyon-juniper and other coniferous woodlands	
Myotis thysanodes pahasapensis	1 myon jumper and other connerous woodiands	
Gunnison's prairie dog	Grasslands and semidesert and montane shrublands	
Cynomys gunnisoni	Orassiands and seminaesert and monante singularias	
New Mexico meadow jumping mouse	Mesic grass/forb/sedge riparian habitat	
Zapus hudsonius luteus	5-11-11-11-11-11-11-11-11-11-11-11-11-11	
North American wolverine	Rare; boreal spruce-fir forest and tundra	
Gulo gulo		
Spotted bat	Pinyon-juniper, shrub desert, possibly riparian	
Euderma maculatum		
Townsend's big-eared bat	Abandoned mines and caves	
Corynorhinus townsendii		
Amphibians		
Boreal toad	Damp conditions; marshes, wet meadows, streams, ponds, lakes	
Bufo boreas boreas	Dump Conditions, marshes, wer include wis, survains, portas, takes	
Canyon treefrog		
Northern leopard frog	Water's edge; wet meadows, banks of marshes and ponds	
Rana pipiens	water 5 edge, wet incadows, banks of marsiles and ponds	
Reptiles		
Desert spiny lizard		
Longnose leopard lizard		

Table P.7: Bureau of Land Management Sensitive Plant Species and their Habitat Associations on the Tres Rios Field Office

Sensitive Plant Species	Habitat Association or Veg Type
Amsonia jonesii	Pinyon-juniper woodlands and desert shrub in runoff-fed draws on
(Jones' bluestar)	sandstone
Astragalus naturitensis	Pinyon-juniper woodlands (grows in the cracks of sandstone
(Naturita milkvetch)	bedrock, associated with biological soil crusts)
Astragalus schmolliae*	Mature pinyon-juniper woodlands on mesa tops in the Mesa Verde
(Schmoll's milkvetch)	area
Cryptogramma stelleri	Riparian/wetlands (cliff crevices and seeps in calcareous soils)
Erigeron kachinensis	Riparian/wetland (saline soils in alcoves and seeps in desert canyon
(Kachina daisy)	walls)
Eriogonum clavellatum	Comi degert shruhlanda with shedgeele selthrush on shele seils
(Comb Wash buckwheat)	Semi-desert shrublands with shadscale saltbrush, on shale soils
Gutierrezia elegans	Pinyon-juniper, semi-desert shrubland, sagebrush (barren Mancos
(Lone Mesa snakeweed)	shale outcrops)
Lesquerella pruinosa	Mountain grasslands and mountain shrublands (soils derived from
(frosty bladderpod)	Mancos shale)
	Pinyon-juniper, semi-desert shrublands with shadscale, and
Lygodesmia doloresensis	sagebrush communities on reddish, purple, sandy alluvium and
(Dolores river skeleton plant)	colluvium of the Cutler Formation between the canyon walls and
	the Dolores river
Mimulus eastwoodiae	Riparian/wetland (shallow caves and seeps on canyon walls,
(Eastwood's monkeyflower)	hanging gardens)

Sensitive Plant Species	Habitat Association or Veg Type
Pediomelum aromaticum (aromatic Indian breadroot)	Semi-desert shrublands and sagebrush shrublands
Physaria pulvinata	Pinyon-juniper, semi-desert shrubland, sagebrush (barren shale
(cushion bladderpod)	outcrops)

Table P.8: Bureau of Land Management and U.S. Forest Service Sensitive Fish Species and Their Habitat Associations on the San Juan National Forest and Tres Rios Field Office

Sensitive Species	Habitat Association or Vegetation Type
Fish	
Roundtail chub (Gila robusta)	Tributaries of the Colorado and San Juan Rivers
Bluehead sucker (Catostomus disobolus)	Tributaries of the Colorado and San Juan Rivers
Flannelmouth sucker (Catostomus latipinnis)	Tributaries of the Colorado and San Juan Rivers
Colorado River Cutthroat Trout (Oncorhynchus clarki pleuriticus)	Tributaries of the Colorado and San Juan Rivers

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## **Appendix Q**

## Plan Components Addressing Species Diversity and Population Viability

## **CHAPTER 1. INTRODUCTION**

The following tables provide a crosswalk between Land and Resource Management Plan (LRMP) components and the ecosystem elements and environmental factors that play a major role in determining the diversity, abundance, and/or distribution of species and populations on the San Juan National Forest (SJNF). They also provide a better understanding of the framework used to address the legal and regulatory requirements for species diversity and population viability within the LRMP (see Section 2.1). In addition to the LRMP components listed below, a number of oil and gas leasing stipulations, as well as direction from documents listed under "Additional Guidance" in the LRMP, provide added protections that may address species diversity and population viability.

Table Q.1: Terrestrial Wildlife

	restrial Wildlife	Significant		LRMP Co	omponents	
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
Physical Habitat	Quantity	Y	2.2.1, 2.2.2, 2.2.3, 2,2,4, 2.2.6, 2,2,7, 2.2.9, 2,2,15, 2,2,16, 2.2.18, 2,2,22, 2.3.1, 2.3.2, 2.3.4, 2.3.7, 2.3.8, 2.3.9, 2.3.10, 2.3.12, 2.3.13, 2.3.14, 2.3.15, 2.3.16, 2.3.18, 2.4.6, 2.5.3, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.6.14, 2.6.15, 2.7.4, 2.7.5, 2.8.3, 2.8.5, 2.9.1, 2.10.2, 2.11.3, 2.11.6, 2.11.7, 2.11.8, 2.11.9, 3.12.1, 2.13.13 3.25.17, 3.25.19,	2.2.48, 2.2.49, 2.2.50, 2.3.25, 2.3.29, 2.4.13, 2.5.15, 2.12.8, 2.12.9, 2.12.10, 2,2,52, 2,2,53, 2.2.54, 2.9.5a, 2.10.6, 2.11.11, 3.25.28	2.2.65, 2.3.36, 2.3.38, 2.3.39, 2.3.44, 2,4,20, 2.4.21, 2.6.29, 2.6.30, 2.11.13	2.2.83, 2.2.85, 2.3.66, 2.3.68, 2.3.69, 2.3.70, 2.3.72, 2.3.73, 2.3.75, 2.3.79, 2.3.80, 2.3.81, 2.3.82, 2.3.83, 2,4,22, 2.4.25, 2.4.26, 2.4.28, 2.5.22, 2.5.27, 2.5.28, 2.6.38, 2.7.17, 2.7.20, 2.12.23, 2.13.27, 2.13.29, 2.13.31, 2.18.15
	Quality/ Structure	Y	3.25.21, 3.26.2  2.2.1, 2.2.2, 2,2,3, 2,2,4, 2.2.5, 2.2.6, 2,2,7, 2,2,15, 2,2,16, 2.2.18, 2,2,22, 2.3.1, 2.3.2, 2.3.4, 2.3.7, 2.3.8, 2.3.9, 2.3.10, 2.3.12, 2.3.13, 2.3.14, 2.3.15, 2.3.16, 2.3.17, 2.3.18, 2,4,2, 2.4.3, 2,4,5, 2.4.6, 2.5.1, 2.5.6, 2.5.7, 2.5.8, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.6.14, 2.6.15, 2.7.4, 2.7.5, 2.8.3, 2.8.5, 2.9.1, 2.10.2, 2.11.3, 2.11.6, 2.11.7, 2.11.8, 2.11.9, 2.12.2, 2.13.12, 2.14.36, 2.19.5, 2.21.1, 2.21.2, 2.21.5, 3.12.1, 3.25.4, 3.25.17, 3.25.18, 3.25.19, 3.25.21, 3.27.6,	2.3.25, 2.3.29, 2.4.14, 2.4.13, 2.4.16, 2.5.15, 2.5.16, 2.2.48, 2.2.49, 2.2.50, 2.2.52, 2.2.53, 2.2.54, 2.6.21, 2.10.6, 2.9.5a, 2.11.11, 2.12.8, 2.12.9, 2.12.10, 2.21.7, 3.25.28	2.2.65, 2.3.36, 2.3.38, 2.3.39, 2.3.44, 2.6.29, 2.6.30, 2,4,20, 2.4.21, 2.5.20, 2.11.13	2.2.69, 2.2.74, 2.3.66, 2.3.68, 2.3.69, 2.3.70, 2.3.72, 2.3.73, 2.3.74, 2.3.75, 2.3.76, 2.3.77, 2.3.79, 2.3.80, 2.3.81, 2.3.82, 2.3.83, 2,4,22, 2.4.25, 2.4.26, 2.4.28, 2.5.22, 2.5.25, 2.5.26, 2.5.27, 2.5.28, 2.6.38, 2.18.15, 2.2.83, 2.2.85, 2.7.17, 2.7.20, 2.7.22, 2.7.34, 2.11.17, 2.12.23, 2.12.25, 2.13.23, 2.13.27, 2.13.29, 2.13.31,

		Significant		LRMP C	omponents	
Category	Factor	Factor (Y/N)	<b>Desired Conditions</b>	Objectives	Standards	Guidelines
			3.27.7,			
	Distribution	Y	2.2.1, 2.2.2, 2,2,3, 2,2,4, 2.2.6, 2.2.18, 2.2.21, 2.3.1, 2.3.2, 2.3.4, 2.3.6, 2.3.7, 2.3.8, 2.3.9, 2.3.10, 2.3.12, 2.3.13, 2.3.14, 2.3.15, 2.3.16, 2.3.18, 2.3.19, 2.5.6, 2.5.8, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.11.3, 2.11.6, 2.11.7, 2.11.8, 2.11.9, 3.12.1, 2.13.13,	2.3.25, 2.3.29	2.2.65, 2.3.36, 2.3.38, 2.3.44, 2.6.30	2,2,74, 2.2.85, 2.3.66, 2.3.68, 2.3.69, 2.3.70, 2.3.72, 2.3.73, 2.3.74, 2.3.75, 2.3.79, 2.3.80, 2.3.81, 2.3.82, 2.3.83, 2.4.25, 2.4.26, 2.7.34
			3.26.2, 3.27.6			
	Connectedness	Y	2,2,3, 2,2,4, 2.3.1, 2.3.2, 2.3.4, 2.3.6, 2.3.9, 2.3.12, 2.3.13, 2.3.14, 2.3.15, 2.3.16, 2.3.18, 2.3.19, 2.5.8, 2.5.9, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.6.14, 2.6.15, 2.11.3, 2.11.9, 2.8.3, 2.19.3, 2.19.5, 3.12.1, 3.25.18, 3.26.2, 3.27.6, 3.27.7	2.3.25, 2.4.14	2.2.65, 2.3.38, 2.5.16, 2.6.30	2.3.70, 2.3.72, 2.3.73, 2.3.75, 2.3.76, 2.3.77, 2.3.79, 2.3.80, 2.3.81, 2.3.82, 2.3.83, 2.6.38, 2.12.23, 2.12.25, 2.13.27, 2.13.23, 2.13.29, 2.13.31, 2.18.15
Biological Factors	Disease	Y	2.3.1, 2.3.3, 2.3.14	2.3.31	2.3.40, 2.3.41, 2.3.42, 2.3.43, 2.5.20, 2.7.11, 2.7.12	2.3.68, 2.7.17, 2.3.80, 2.3.81, 2.3.82
	Competition	N	2.3.1, 2.3.2, 2.3.5, 2.3.13, 2.3.14,2.8.3, 2.8.5,		2.3.40, 2.3.41, 2.3.42, 2.3.43	2.3.80. 2.3.83, 2.7.17, 2.7.20
	Exotic Species	N	2.3.3, 2.8.3, 2.8.5	2.3.31		

		Significant		LRMP Co	omponents	
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
	Natural Ecological Processes	Y	2.2.1, 2.2.2, 2,2,3, 2,2,4, 2.2.6, 2,2,7, 2,2,15, 2,2,16, 2,2,22, 2.3.1, 2.3.2, 2.3.5, 2.3.7, 2.3.8, 2.3.9, 2.3.10, 2.3.12, 2.3.14, 2.3.15, 2.3.16, 2.3.17, 2.3.18, 2.4.1, 2.4.2, 2.4.6, 2.6.7, 2.10.2, 2.11.3, 2.11.6, 2.11.7, 2.11.8, 2.11.9, 2.10.2, 3.12.1, 3.25.21, 2.5.1, 2.5.6, 2,5,9, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.6.14, 2.6.15, 2.8.3, 2.8.5, 2.9.1, 2.10.2	2.2.48, 2.2.49, 2.2.50, 2.4.13, 2.5.15, 2.11.11, 2.10.6	2.3.39, 2,4,20, 2,4,21, 2.6.30, 2.11.13	2.2.74, 2.2.85, 2.3.70, 2.3.73, 2.3.74, 2.3.79, 2.3.80, 2.3.81, 2.3.82,2.3.83, 2,4,22
Human	Harvest	Y	, , , , , , , , , , , , , , , , , , , ,			
Factors	Human Caused Mortality	N	2.3.2, 2.3.6, 2.3.8, 2.3.9, 2.3.14, 2.3.15, 2.3.17, 2.6.14, 2.6.15, 2.12.2	2.3.29	2.3.36, 2.3.38, 2.3.39, 2.3.40, 2.3.41, 2.3.42, 2.3.43, 2.3.44	2.3.66, 2.3.68, 2.3.75, 2.5.27, 2.3.69, 2.3.70, 2.3.73, 2.3.74, 2.3.76, 2.3.77, 2.3.79, 2.3.80, 2.3.81, 2.3.82, 2.3.83
	Human Caused Disturbance	Y	2.2.2, 2.3.1, 2.3.2, 2.3.6, 2.3.8, 2.3.9, 2.3.12, 2.3.14, 2.3.15, 2.3.16, 2.3.18, 2.6.11, 2.13.6, 2.13.13, 2.14.36, 2.19.3, 2.19.5, 2.21.5, 3.25.4	2.6.21, 2.13.19	2.3.36, 2.3.38, 2.3.39, 2.5.20, 2.6.30	2.3.66, 2.3.68, 2.3.69,2.3.70, 2.3.72, 2.3.75, 2.3.76, 2.3.77, 2.3.79, 2.3.80, 2.3.81,2.3.82, 2.3.83, 2.6.38, 2.11.17, 2.12.25 2.13.27,2.13.23, 2.13.29,2.13.31,
Species- Specific Management	Monitoring of Listed or Sensitive Species	N		2.3.30	2.3.38,	2.3.67

		Significant	LRMP Components			
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
	Recovery of	N	2,2,3, 2,2,4, 2,2,7,	2.3.25, 2.3.28, 2.3.29,	2.2.65 2.3.36, 2.3.38,	2,2,74, 2.3.68, 2.3.69,
	Listed or		2,2,22, 2.3.1, 2.3.3,	2.3.30, 2.3.31, 2.4.13,	2.3.39, 2.3.40, 2.3.41,	2.3.70, 2.3.72, 2.3.73,
	Sensitive		2.3.4, 2.3.6, 2.3.7, 2.3.8,	2.5.15	2.3.42, 2.3.43, 2.3.44,	2.3.74,2.3.75, 2.3.80,
	Species		2.3.9, 2.3.12, 2.3.13,		2.4.20, 2.4.21, , 2.5.20,	2.3.81, 2.3.82, 2.3.83,
			2.3.14, 2.3.15, 2.3.16,		2.6.30, 2.7.11, 2.7.12,	2.5.27, 2,4,22, 2.4.25,
			2.3.17, 2.3.18, 2.3.19,		2.11.13	2.4.26, 2.5.22, 2.5.25,
			2.4.5, 2.4.6, 2.5.9, 2.6.7,			2.5.26, 2.5.28, 2.18.15
			2.6.9, 2.6.11, 2.21.5,			
			3.27.7			

Table Q.2: Aquatic Ecosystems and Fisheries

		Significant		LRMP Co	omponents	
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
Physical Factors	Water Quantity	Y	2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6, 2.5.12, 2.6.7, 2.6.9, 2.6.11, 2.6.13, 2.6.14, 2.6.15, 2.6.16, 2.6.17	2.5.14, 2.6.28,	2.4.19, 2.5.18	2.5.22, 2.6.39
	Water Quality	Y	2.4.3, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.7, 2.6.1, 2.6.2, 2.6.3, 2.6.4, 2.6.5, 2.6.10,	2.6.18, 2.6.19, 2.6.20, 2.6.21, 2.6.22, 2.6.23	2.6.29, 2.6.30, 2.11.14	2.4.27, 2.5.24, 2.5.25, 2.5.26, 2.5.28, 2.6.32, 2.6.33, 2.6.34, 2.6.35, 2.6.36, 2.6.37, 2.6.38, 2.6.39, 2.6.40, 2.11.17
	Substrate	N	2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.6.7, 2.6.12	2.5.15		2.5.24, 2.5.25
	Woody Debris	N	2.4.3, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5	2.5.15		2.4.27
	In-channel features	N	2.4.3, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.9, 2.6.7, 2.6.8, 2.6.9	2.5.15		
	Habitat Connectivity	N	2.5.1, 2.5.3, 2.5.8, 2.5.9	2.5.16		2.5.23

		Significant		LRMP Co	omponents	
Category	Factor	Factor (Y/N)	<b>Desired Conditions</b>	Objectives	Standards	Guidelines
Biological	Introduced/	Y	2.5.1, 2.8.3, 2.8.6	2.3.31	2.8.13, 2.11.14	2.8.14, 2.8.15, 2.8.16,
Factors	Invasive Spp.					2.8.17, 2.8.18, 2.8.19
	Disease	Y	2.5.1, 2.5.10	2.3.31	2.5.19, 2.5.20	
	Riparian Veg.	N	2.4.1, 2.4.2, 2.4.3, 2.5.2, 2.6.6, 2.6.7, 2.6.8, 2.14.22	2.4.13, 2.4.15, 2.4.16, 2.4.17, 2.4.18	2.6.30	2.4.21, 2.4.22, 2.4.24, 2.4.25, 2.4.27, 2.5.26, 2.7.22, 2.7.23, 2.11.17
Human Factors	Fishing mortality	N	2.5.1			
	Stocking	N	2.5.1			
Species Specific Factors	Conservation Plans and Strategies	NA	2.5.11, 2.5.12, 2.5.13	2.5.17		2.5.21
	Other					2.5.27, 2.5.28

Table Q.3: Terrestrial Ecosystems and Plant Species Diversity and Viability Table

		Significant		LRMP Components				
Category	Factor	Factor (Y/N)	<b>Desired Conditions</b>	Objectives	Standards	Guidelines		
Physical	Soil conditions		2.2.32-36	2.2.42, 2.2.44, 2.2.53, 2.2.56	2.2.61, 2.2.65	2.2.66, 2.2.71-72, 2.2.74		
	Forest stand structure		2.2.1, 2.2.5, 2.2.19-25	2.2.45, 2.2.51		2.2.73, 2.2.78, 2.2.79		
	Distribution of various threatened and endangered species across		2.2.3, 2.2.4, 2.2.18	2.2.46-50		2.2.70, 2.2.81		
	the landscape							

		Significant		LRMP Co	omponents	
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
	Abundance and distribution of desirable native plant species within threatened and endangered species		2.2.8-11, 2.2.18, 2.2.20-31	2.2.43, 2.2.44, 2.2.53		2.2.69, 2.2.77
	Presence or condition of habitat for special status plant species or other rare plant species		2.2.6, 2.2.38-41	<del></del>	2.2.65	2.2.67, 2.2.76
	Presence of or impacts to soil crusts		2.2.25, 2.2.27-29, 2.2.37	2.2.44		2.2.75
	Resilience to climate change and other stressors		2.2.1, 2.2.6-7, 2.2.12-16, 2.2.18	2.2.45, 2.2.54-55, 2.2.57-58, 2.2.60		2.2.82
Biological	Native plant species diversity		2.2.1, 2.2.14, 2.2.18	2.2.43-44, 2.2.51-55, 2.2.57-59	2.2.63, 2.2.64, 2.2.65	2.2.68, 2.2.69, 2.2.82
	Impacts to special status plant species and other rare plant species		2.2.41	2.2.55	2.2.63, 2.2.64, 2.2.65	2.2.68
	Presence of invasive plant species		2.2.2, 2.2.20-31	2.2.44	2.2.62	2.2.80

**Table Q.4: Wetland and Riparian Ecosystems** 

		Significant	LRMP Components			
Category	Factor	Factor (Y/N)	Desired Conditions	Objectives	Standards	Guidelines
Physical	Hydrology and	Y	2.2.41, 2.4.6, 2.4.7,	2.4.15	2.4.19, 2.6.29, 2.6.30	2.4.22, 2.5.28, 2.7.22,
Factors	Water Sources		2.5.4, 2.6.8, 2.6.9, 2.6.11			2.7.23
	Soils	Y	2.4.2, 2.4.7, 2.4.9,	2.4.15	2.2.80, 2.4.19	2.4.22, 2.4.24, 2.7.23
			2.4.10, 2.4.11, 2.4.12			
Biological	Introduced/	Y	2.4.1, 2.8.3	2.4.16	2.8.13, 2.11.14	2.4.27, 2.8.16, 2.8.18,
Factors	Invasive Spp.					2.8.19
	Special Status	N	2.2.41, 2.2.43	2.5.15	2.2.66, 2.2.67	2.2.71, 2.2.80, 2.5.28
	Species		·		·	
	Riparian Veg.	Y	2.4.1, 2.4.2, 2.4.3, 2.4.6,	2.4.13, 2.4.15, 2.4.17,	2.4.12, 2.4.19, 2.4.20,	2.4.21, 2.4.22, 2.4.23,
			2.4.7, 2.4.8, 2.5.2, 2.6.7,	2.4.18	2.4.21, 2.8.13, 2.6.30	2.4.25, 2.4.26, 2.5.26,
			2.6.8		,	2.7.23, 2.7.28

## **Appendix R**

## Bureau of Land Management Master Leasing Plan Policy and Description of Leasing Analysis

## **CHAPTER 1. – INTRODUCTION**

The Master Leasing Plan (MLP) policy was initiated in May 2010 through the Bureau of Land Management (BLM) Washington Office's Oil and Gas Leasing Reform Instruction Memorandum (IM) 2010-117 to provide for a proactive approach to planning for oil and gas development when changing circumstances, updated policies, and new information warrants taking a more focused look at resource management plan decisions pertaining to oil and gas leasing and post-leasing development of an area.

The BLM, with the U.S. Forest Service (USFS), has prepared a Proposed Land and Resource Management Plan (LRMP) and Final Environmental Impact Statement (FEIS) for the Tres Rios Field Office (TRFO), which includes oil and gas leasing analysis. The Draft LRMP and Environmental Impact Statement (EIS) were published in December 2007 with a 120-day comment period. Additionally a Supplement to the Draft EIS was published in August 2011 with a 90-day comment period. The Supplement was needed to disclose increased development projections associated with the potential for shale gas development that was identified by industry within the planning area. The Supplement also included a more detailed air quality model and analysis. During the comment period for the Supplement to the Draft EIS, the comments requested a MLP be considered for the Paradox Basin (which includes a large amount of National Forest System (NFS) lands and private minerals within the proposal).

As explained herein, although the LRMP area does not meet the criteria for preparation of an MLP, the BLM did consider the MLP guidance in finalizing the LRMP to ensure consistency with the MLP policy. The MLP policy does not apply to NFS lands; therefore, this appendix describes the applicable BLM-specific oil and gas analysis in the LRMP.

BLM IM WO-2010-117 lists criteria to be considered. Specifically, an MLP is required when all four of the following criteria are met:

- A substantial portion of the area to be analyzed in the MLP is not currently leased.
- There is a majority federal mineral interest.
- The oil and gas industry has expressed a specific interest in leasing, and there is a moderate or high potential for oil and gas confirmed by the discovery of oil and gas in the general area.
- Additional analysis or information is needed to address likely resource or cumulative impacts if oil and gas development were to occur where there are:
  - multiple-use or natural/cultural resource conflicts;
  - impacts on air quality;
  - impacts on the resources or values of any unit of the National Park System, national wildlife refuge, or USFS wilderness area, as determined after consultation or coordination with the National Park Service (NPS), the U.S. Fish and Wildlife Service, or the USFS; or
  - impacts on other specially designated areas.

The BLM also has the discretion to complete an MLP for areas that do not meet the MLP criteria. The MLP process entails analyzing likely development scenarios and varying levels of protective design features and mitigation measures in a defined area at a less site-specific level than a master development plan that has been fully defined by an operator.

## CHAPTER 2. – BUREAU OF LAND MANAGEMENT OIL AND GAS ANALYSIS

Chapter 3 of the FEIS documents the environmental analysis of five alternative scenarios for oil and gas leasing in the planning area. Resources that may be impacted by leasing and subsequent projected development of such leases include ecosystem components, such as soils, forested vegetation, and wildlife, as well as land uses and values such as domestic livestock grazing, timber, recreation, cultural/heritage resources, scenic byways, etc. The social and economic impacts of oil and gas development to surrounding communities and governments are also evaluated.

Approximately 79% of the Northern San Juan Basin (NSJB), is fully leased and developed. Within the NSJB, the remaining question is how to condition further development of existing leases as additional wells are proposed. Anticipated development could involve constructing additional wells on existing, expanded well pads. The analysis of NSJB development and the relation to the revised LRMP decisions is also analyzed.

Another area with low to moderate oil and gas potential is the San Juan Sag. The BLM projects that one to two exploratory wells would be requested annually over the life of the LRMP and that there would be minor interest in leasing in the San Juan Sag. Additionally, only about 14% of the mineral estate is federally owned.

The TRFO identified and analyzed Paradox Leasing Analysis Area (PLAA) because it contains the high and moderate potential areas, areas of known (i.e., producing) oil and gas development, areas where industry has expressed interest, and areas where oil and gas development potential exists. Within the PLAA there are multiple ownerships; however, only the BLM mineral estate acreage is included in this appendix and used to address the MLP four criteria and concerns raised in the external MLP. The analysis done in this document is based on BLM and split estate mineral acreage only and does not include USFS-administered lands. Any reference to "federal minerals" in this appendix will refer to BLM surface and private surface with federal minerals.

In November 2011, the Wilderness Society, the San Juan Citizens Alliance, and Rocky Mountain Wild requested that the BLM and USFS prepare a Paradox Basin MLP. The boundary and overall acreages of the externally proposed MLP area differ significantly from those in the PLAA. The difference in acreage is attributed to their proposal including private mineral estates and NFS lands.

## 2.1 Paradox Leasing Analysis Area

## 2.1.1 Criterion #1: A substantial portion of the area to be analyzed in the MLP is not currently leased.

The BLM federal mineral estate (BLM surface and private surface with federal minerals) in the PLAA includes 618,061 acres. Of the BLM federal mineral estate, 48% is already leased and 53,933 acres (or 9%) would not be available for lease. Currently there are 317 active leases in the PLAA. Figure R.3 depicts the lands that are not available for lease (figures provided at end of Appendix R). The areas not available for lease include the wilderness study areas (WSAs) within the PLAA and portions of the Dolores River Canyon (specifically the wild segments of the Dolores River recommended for Wild and Scenic River status). Considering what is already leased and the acres that would not be available for lease, the remaining acres available for lease within the PLAA total 269,226 or 44%. Additionally, due to unfavorable geologic conditions, some of the remaining acreage would be not desirable for leasing.

Figure R.1, shows in general that the leased minerals of the Paradox Basin are generally contiguous. Those areas that remain unleased as of this analysis do occur within the high to moderate hydrocarbon potentials.

These 269,266 acres of unleased land are generally associated with: 1) deeply incised, extremely steep river canyon corridors where rugged topography inhibits industry access (the Dolores Canyon corridor in Dolores and San Miguel Counties and the Summit Canyon corridor in San Miguel County; 2) lands along the axis of northwest-southeast-trending synclines with poor hydrocarbon trap configuration (Dry Creek Basin and Disappointment Valley areas of San Miguel County); and, lastly, 3) areas between existing fields where previous leased acreage has expired due to unsuccessful wildcat drilling results (above Summit Canyon and in the Big Gypsum Valley areas of San Miguel County).

Therefore, the majority of the areas that are currently unleased have either been previously leased or do not contain geologic conditions conducive to oil and gas trapping and production.

It is important to note that the inclusion of currently leased lands, WSAs, similar landscapes, and areas stipulated as No Surface Occupancy (NSO), only 37% of the federal lands are available for leasing and not protected from surface occupancy.

Finally, of the 269,226 acres that would be made available for lease (and that are not currently leased), 47% of the area includes NSO stipulations to protect resources. An additional 43% have Controlled Surface Use (CSU) and Timing Limitations (TL) stipulations, with the remaining 11% having standard lease terms.

## 2.1.2 Criterion #2: There is a majority federal mineral interest.

Using the information in Table R.1, approximately 48% of the PLAA land area is currently leased (294,902 acres). Lands encompassed by WSA and lands not available for leasing/withdrawn lands amount to approximately 9% of the area. Considering what is already leased and the acres that would not be available for lease, the remaining acres available for lease within the PLAA total approximately 44% of the area (269,226 acres). These acres are not in one large identifiable block but are dispersed throughout the area.

Table R.1: Mineral Estate Ownership within the Paradox Leasing Analysis Area

	Acres	Leased Acreage
BLM federal surface and mineral estate	433,866	192,291
Split estate (private or other surface owner with BLM mineral estate)	184195	102,611
Total	618,061	294,902

## 2.1.3 Criterion #3: The oil and gas industry has expressed a specific interest in leasing, and there is a moderate or high potential for oil and gas confirmed by the discovery of oil and gas in the general area.

The TRFO and southwest Colorado have been an area with oil and gas potential with a long history of development. Commercial production started as early as 1920. Data from the Colorado Oil and Gas Conservation Commission database show that 1,339 wells have been drilled in the planning area, which includes both BLM and NFS lands. Forty percent of these wells (533) were drilled after 1984. At the end of 2004, there were 502 producing wells, 339 (68%) of which were located in the Ignacio-Blanco coalbed methane (CBM) field of Archuleta and La Plata Counties. Of the remainder, 156 wells (31%) produced conventional oil and gas in Dolores, Montezuma, and San Miguel Counties.

Specifically, the PLAA within the TRFO is an area where oil and gas industry has expressed leasing and development interest. As discussed under Criterion #1, the area contains a significant amount of existing leases (317) and has had successful development over the past 90+ years. Additionally, the emergence of the Gothic Shale Gas Play (GSGP) within the PLAA (which was identified by industry in 2008 and necessitated the Supplement to the Draft EIS) is of interest to industry, especially given the advancement of horizontal drilling and hydraulic fracturing technology that has made development of shale gas possible and more economical. As disclosed in the reasonably foreseeable development projections of the FEIS, as many as 2,145 wells may be drilled in the planning area in the next 15 years. This includes BLM, NFS, state, and private lands. On the BLM and split estate lands alone, it is estimated that as many as 610 wells may be drilled. This includes both conventional and GSGP wells. These estimated numbers were generated from industry interviews, leasing trends, and current and projections of future hydrocarbon prices. It is expected that due to the remoteness of some potential locations, development activities would occur adjacent to existing infrastructure, which would assist in minimizing impacts.

Table R.2 provides the acres of hydrocarbon potential within the PLAA on BLM surface and private surface with federal minerals and Figure R.4 provides a visual depiction of the hydrocarbon potential.

Table R.2: Hydrocarbon Occurrence Potential within the PLAA (acres)

Mineral Estate Ownership	High Potential	Moderate Potential	Low Potential	No Potential
BLM (including split estate)	439,595	178,465	1917	0

As shown in Table R.2, the majority of the BLM mineral estate is within areas identified to have moderate or high potential. Including split estate acres, the BLM has 37% of the high and moderate potential lands

2.1.4 Criterion #4: Additional analysis or information is needed to address likely resource or cumulative impacts if oil and gas development were to occur where there are multiple use or natural/cultural resource conflicts, impacts on air quality, impacts on the resources or values of any unit of the NPS, or impacts on other specially designated areas.

In developing the LRMP for the TRFO, there were many public scoping meetings and two public comment periods (one for the Draft EIS and one for the Supplement to the Draft EIS), all of which identified resources of concern and important landscapes needing protection when allowing extractive resource use and management activities. The TRFO used these comments to develop plan direction for resource management and specifically for developing oil and gas leasing stipulations. In the external MLP submitted, concerns were specifically focused on the following TRFO resources: fish and wildlife, special status species, wilderness quality lands, recreation, Areas of Critical Environmental Concern (ACECs), and Colorado Natural Heritage Program potential conservation areas (PCAs). According to IM 2010-117, other important national and local resource issues that should be considered when developing an MLP include air quality: Special Recreation Management Areas; nearby state, tribal, or other federal agency lands; cultural resources; paleontological resources; visual resources; watershed conditions, including steep slopes and fragile soils; municipal watersheds; public health and safety; and the ability to achieve interim and final reclamation standards.

Of the 269,226 acres that would be made available for lease (and that are not currently leased), 47% of the area includes NSO stipulations to protect resources. An additional 43% have CSU and TL stipulations, with the remaining 11% having standard lease terms (see Table R.2). Figure R.2 illustrates the leasing stipulations within the PLAA. (Please note that there are overlapping stipulations within the PLAA and Figure R.2 illustrates only the most restrictive stipulation in a particular area. Please see Appendix H for maps that illustrate individual stipulations.)

Table R.3: Acres of Stipulations on Lands Available for Lease in the Paradox Basin (BLM surface and

private surface with federal minerals)

Available and Stipulated Acres in the Paradox Basin	Acres	Percent
Acres available and not currently leased within the Paradox Basin	269,226	44%
Acres of NSO	125,876	47%
Acres of CSU and TL	114,777	43%
Standard lease terms	28,573	11%

The Proposed TRFO LRMP includes a suite of leasing stipulations to protect resources within the Paradox Basin and on all TRFO lands. Table R.5 summarizes the resources of concern and leasing stipulations proposed in the LRMP.

Table R.5: Resources of Concern and Tres Rios Field Office Proposed Leasing Stipulations

Resource	Stipulation	
WSAs: Weber, Menefee, Dolores River Canyon, McKenna Peak	Not available for lease	
Dolores River Canyon	NSO	
Lands with wilderness characteristics: Snaggletooth, Coyote Wash	NSO	

Resource	Stipulation
Occupied critical Gunnison sage-grouse habitat	NSO
Gunnison prairie dog - sensitive species	CSU
Raptors	NSO and TL
Big game and wide ranging animals	TL and CSU
Rare plants (threatened, endangered, and sensitive plants)	NSO
Rare plants (sensitive plants)	CSU
Rare plants (plants w/B1 and B2 rankings by Colorado Natural Heritage Program)	N/A
ACECs	NSO, CSU, and TL depending on resource
Mesa Verde Escarpment (i.e., area adjacent to a national park and protected for its cultural resources)	NSO
Visual resources	NSO
Water resources	NSO, CSU, and TL

The LRMP does include a variety of standards and guidelines to ensure diversity of plants, animals, fish, and overall management for sustainable ecosystems (see Section 2.1 of the LRMP for a full discussion of the ecosystem management strategy).

In addition to Table R.5, below is a summary of the protections that the LRMP and leasing stipulations proposes to protect the resources and areas of concern.

- The Dolores River Canyon has many unique and rare features, hence an NSO is proposed for the whole canyon, rim to rim, including some adjacent canyons and resources.
- Lands with wilderness characteristics are also proposed to be managed with an NSO stipulation.
- Occupied critical Gunnison sage-grouse habitat is proposed to be managed with an NSO stipulation. Additionally, there are stipulations to mitigate noise impacts, retain habitat, and to minimize impacts on currently unoccupied Gunnison sage-grouse habitat.
- Big game severe winter range, concentration areas, and production areas (seasons and locations critical to supporting life functions) have specific TL.
- Raptors: stipulations have been developed to protect nest sites, winter roost, and overall roost sites for various raptors.
- Rare plants: The TRFO has stipulations for threatened, endangered, and sensitive plants.
- ACECs: The TRFO has not applied a stipulation to ACECs, but rather is applying resourcespecific stipulations to the resources of relevance and importance for each of the ACECs. For example, there is a CSU stipulation for gypsum soils (the habitat for the plant species that the ACEC is designated for), NSO and TL to protect raptor nests, CSU and NSO for sensitive, threatened, and endangered plants, etc.
- Mesa Verde Escarpment: The TRFO recognizes the quality of the mostly intact cultural resources at the base of Mesa Verde National Park and protects this area with an NSO stipulation.
- Visual resources: The foreground areas of areas classified to be managed for a Visual Resource Management (VRM) Class II are protected with an NSO stipulation. These are areas valued for their high scenic quality.
- Water resources: The proposed LRMP includes many water resource protection stipulations, including protections for rivers, reservoirs, lakes, perennial streams, riparian areas, fens, groundwater, and public water supplies.
- Air quality protections: The TRFO completed an air quality model for the LRMP and FEIS analysis, which included the projections for oil and gas development on the TRFO and development on adjacent lands and within the region. The model indicated that there could be potentially significant direct and indirect impacts to air quality (nitrogen and sulfur deposition, and visibility at a nearby Class I area), and potentially significant cumulative impacts to air quality (nitrogen dioxide, sulfur dioxide, visibility, and acid neutralizing capability at wilderness lakes). To mitigate these impacts, the LRMP proposes several management actions to reduce impacts on air quality, including the following requirements:

- Nitrogen oxide (NO<sub>x</sub>) limit of 2.0 grams per horsepower-hour or the minimum acceptable limit of regulatory agencies for new or replacement stationary engines less than 300 horsepower.
- NO<sub>x</sub> limit of 1.0 grams per horsepower-hour or the minimum acceptable limit of regulatory agencies for new or replacement stationary engines 300 horsepower or greater.
- Green completion technology for oil and natural gas well completions and for re-stimulation or re-fracture activities during workovers is required to prevent venting and most flaring of methane gas and other air pollutants into the atmosphere.
- For exploration, production, transport, and processing of oil and natural gas, storage vessels must not leak and tank thief hatches must be closed when not being serviced during liquid transport, repair, or measuring activities. Valves must be maintained in a leak-free condition (<10,000-part-per-million leakage). The venting of volatile organic compound (VOC) and hazardous air pollutant emissions would achieve at least 95 % emission reduction from uncontrolled emissions through the use of vapor recovery units, combustion, or other practices allowed by air quality regulatory agencies.</p>
- Valves and pipes in liquid hydrocarbon service would periodically (at minimum on an annual basis) be inspected visually, audibly, or by other means for evidence of leaks. If leaks are detected, equipment must either be repaired or replaced as applicable.
- No-bleed, low-bleed, or air-driven pneumatic devices are required for all new and retrofitted oil and natural gas production sites to reduce methane emissions.
- All new separators and dehydrators used for natural gas production must use 95% control efficiency or better VOC emission control technology compared to uncontrolled emissions.
- At any one point in time, no more than four fluid minerals well pads and associated access roads would be constructed and drilled (or re-completed) concurrently in any given square mile.
- Construction activities that disturb a surface area greater than 1 acre and are of a duration greater than 5 days should use effective dust-suppression materials and techniques to prevent dust from visibly transporting from the area of disturbance
- VOCs, hazardous air pollutants, and greenhouse gases should not be vented from existing
  wells and should achieve at least 95 % emission reduction from uncontrolled emissions
  through capture and delivery to sales pipeline, vapor recovery units, combustion, or other
  practices allowed by air quality regulatory agencies.
- For new lease or new development areas, new mineral development facilities would be collocated and/or centralized.
- Optimization (use of fewer, larger, and more efficient engines with lower emission rates, rather than using many small engines with higher cumulative emissions, less efficiency, and higher cumulative horse power) should be required for fluid mineral development.
- Centralized and efficient liquid gathering systems should be used to carry condensate and produced water from wells to centralized gathering facilities to reduce mobile source emissions and other traffic impacts.
- Drill rig engines used for new or recompleted wells on the TRFO should meet the most current non-road diesel engine rules for Tier 2, Tier 4 transitional, or Tier 4 emission standards as these standards phase in over time.
- Recovered fluids should be disposed of properly.

The air quality impacts analysis did not model ozone at the agreement of stakeholders, but a management strategy for ozone analysis and monitoring was disclosed in the EIS and is summarized as follows:

- The BLM and USFS would monitor ozone downwind of the project at a site selected by the Colorado Department of Public Health and Environment, BLM, and USFS.
- The BLM and USFS would commit to long-term air quality monitoring (including ozone) at the Shamrock station.
- The BLM and USFS have authority and would apply resource-protective standards, guidelines, stipulations, and other mitigation measures on new leases. The agencies may also condition the approval of permits on existing leases if resource conditions warrant.

 Ozone modeling would be implemented when 210 wells have been permitted in the GSGP area or when project-level or field development National Environmental Policy Act (NEPA) analysis is conducted, whichever occurs first.

In addition to the resources of concern identified by the external MLP proposal, the TRFO has leasing stipulations for other wildlife, fish and bird species, steep slopes and sensitive soils, visual resources and recreation, and cultural and heritage resources. Appendix H provides a full description of the oil and gas leasing stipulations. All new leases would be subject to these leasing stipulations and the LRMP direction.

### Water and Soil Related Stipulations and Lease Notices

- Municipal watersheds and public water supply (NSO and CSU)
- Major river corridors (NSO)
- Perennial streams, water bodies, riparian areas, and fens (NSO and CSU)
- Intermittent and ephemeral streams (NSO and CSU)
- Jurisdictional dams (NSO)
- Groundwater resources (CSU)
- Reservoirs and lakes (NSO)
- Lands with slopes greater than 35% (NSO)
- Lands with 25% to 35% slopes and lands with shale soils (CSU)
- Lands prone to mass movement (NSO)
- Lands with gypsum soils (CSU)
- Lands with biological soil crusts (CSU)

### Vegetation and Plant Related Stipulations and Lease Notices

- Threatened or endangered plants (NSO)
- Colorado BLM State Director's sensitive plants (CSU)
- Old growth forests and woodlands (NSO)

#### Wildlife and Aquatic Related Stipulations and Lease Notices

- Mexican spotted owl (NSO)
- Lynx landscape linkage, denning and winter foraging habitat (CSU and TL)
- Southwestern willow flycatcher (NSO and TL)
- Gunnison sage-grouse occupied critical habitat (NSO, CSU, TL)
- Columbian sharp-tailed grouse (NSO, CSU and TL)
- Colorado River cutthroat trout (NSO)
- Greenback cutthroat trout (NSO)
- State wildlife areas (NSO)
- Eagles, all accipiters, falcons, buteos, and owls (NSO and TL)
- Big game parturition (TL)
- Big game severe winter range, winter concentration, and mule deer critical winter range and big game production areas (CSU and TL)
- Gunnison prairie dog (CSU)
- Bats (NSO)

## Cultural Related Stipulations and Lease Notices

- Cultural resources (NSO)
- Horse Range Mesa paleontological site (NSO)

#### Recreation and Scenery Related Stipulations

- Developed administrative and recreation sites (NSO and CSU)
- Special Recreation Management Areas (CSU)
- National scenic byways; All American Roads and backcountry byways; designated scenic, recreation, and historic trails and recreation emphasis corridors (NSO)
- High scenic integrity objective and CRM Class II areas (NSO)

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#### **Appendix S**

Response to Comments on the San Juan/Tres Rios Draft Land and Resource Management Plan and Draft and Supplemental Environmental Impact Statements

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Land and Resource Management Plan

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#### **CHAPTER 1 – INTRODUCTION**

Public involvement is critical in shaping a plan for the management of public lands. Public comments ensure a plan is designed that not only meets agency missions and legal mandates, but addresses the interests of the American public.

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require that lead agencies evaluate comments received from persons who review a Draft Land and Resource Management Plan (LRMP)/Draft Environmental Impact Statement (EIS) and prepare a written response. This appendix is a summary of the substantive public comments received on the Draft LRMP/EIS and the Supplement to the Draft EIS for the U.S. Forest Service (USFS) San Juan National Forest (SJNF) and Bureau of Land Management (BLM) Tres Rios Field Office (TRFO) and the response to those comments.

The SJNF and TRFO provided the public a 120-day comment period for the Draft LRMP/EIS. The comment period began on December 14, 2007, and ended on April 11, 2008. A 90-day comment period was also provided on the Supplement to the Draft EIS from August 26 to November 25, 2011. Approximately 53,781 letters were received from members of the public; city, county, state, tribal and federal officials; public interest organizations; and private businesses during these two comment periods. Of these, 52,273 were form letters; the remaining 1,508 letters consisted of original responses or form letters with additional original text.

#### **CHAPTER 2 – CONTENT ANALYSIS**

A standardized content analysis process was conducted to analyze the public letters received on the Draft LRMP/EIS and Supplement to the Draft EIS (hereafter "Draft LRMP/EIS" refers to all comments received on the Draft LRMP, Draft EIS, and Supplement to the Draft EIS). Content analysis is designed to extract comments from each letter received, evaluate similar comments from different letters, and identify specific topics of concern. Additionally, content analysis ensures that every comment is considered fairly and accurately represents the breadth and depth of the public's viewpoints. All letters and comments have been treated equally. They are not weighted by status of respondents or organizational affiliation and it does not matter if an idea was expressed by thousands of people or a single person. The content analysis process also provides a relational database capable of reporting various types of information while linking comments to the original letters.

During the content analysis process, each letter (including postcards, faxes, emails, or other documents), was assigned a unique tracking number. Content analysts then read all letters in their entirety and proceeded to identify discrete comments within them. Each letter may have contained anywhere from one to several hundred comments. Each comment was entered verbatim into a project database and coded based on the particular concern, resource consideration, or proposed management action expressed. Comments were then summarized and/or grouped into public concern statements and given a unique identifying number. Public concern statements range from broad generalities to specific points and can represent one or many comments.

Although many of the submissions were original, the majority of the responses were form letters. Form letters are five or more letters that contain identical text but are submitted by different people. Each form letter was analyzed to ensure that the concerns of all respondents were considered. If a respondent added information to a form letter, this content was considered a unique comment and coded/grouped as necessary.

#### 2.1 Substantive vs. Non-substantive

The final step of content analysis involved determining whether a comment was *substantive* or *non-substantive* in nature. A *substantive* comment does one or more of the following:

- Questions, with a reasonable basis, the accuracy of the information and/or analysis in the Draft LRMP/EIS
- Questions, with a reasonable basis, the adequacy of the information and/or analysis in the Draft LRMP/EIS
- Presents reasonable alternative other than those presented in the Draft LRMP/EIS that meet the purpose and need of the proposed action and addresses significant issues
- Questions, with a reasonable basis, the merits of an alternative or alternatives
- Causes change in or revisions to the proposed action
- Questions, with reasonable basis, the adequacy of the planning process itself

Consistent with 40 Code of Federal Regulations (CFR) 1503.4(b), all substantive comments received a response.

The SJNF and TRFO are not required to respond to non-substantive comments. Although every comment was carefully considered and reviewed, non-substantive comments did not receive a detailed response. A *non-substantive* comment is categorized as one of the following:

- General comment, opinion, or position statement
- Concern is outside the scope or irrelevant to the propose action and decision
- Means of addressing the concern are already decided by law, regulation, or policy
- Concern can be better addressed through another decision process (e.g. project level analysis)
- Concern requests action that has already been considered in an alternative

After completion of the content analysis, public concerns were given to members of the interdisciplinary team for response.

# CHAPTER 3 – HOW TO USE THIS COMMENT-RESPONSE DOCUMENT

Table S.1 displays the names of the individuals, organizations, and governmental agencies that commented on the Draft LRMP/EIS and the Supplement to the Draft EIS, along with their corresponding public concerns. Public concerns have alpha-numeric identifiers (e.g., AQ1) in order to facilitate tracking throughout the response process. These identifiers are for tracking purposes only, and in no way indicate ranking by priority or importance.

Table S.1 is organized alphabetically by last name, with anonymous submittals listed as "Anonymous." To find a comment and response, locate the commenter or organization's name in the table and then find the associated alpha-numeric public concern number(s). The letter abbreviation part of the public concern number identifies which section the public concern can be found in (e.g. AQ = Air Quality).

Table S.2 is an index of the public concern letter-abbreviations, associated sections, and the page number on which that section begins. Sections are organized alphabetically. There are some planning issues covered in the LRMP and Final Environmental Impact Statement (FEIS) for which no comments (or substantive comments) were received; those issues are not listed in this appendix as there are no substantive comments associated with them.

As an example, Bruce Adams submitted a letter that contained one associated public concern. To read the managing agencies' response to Bruce Adam's comment, first find his name in Table S.1, and then look at the public concern number (LR13). Next, look at Table S.2 to see which resource section the letters correspond to; LR corresponds to the "Livestock and Rangeland Management" section which begins on page 48. Turn to page 48, and find LR13 as the fifteenth public concern in this section.

If you do not see your name in the table, your comments were most likely categorized as *non-substantive* and did not receive a detailed response. Please refer to the Content Analysis section of this appendix for a detailed description of non-substantive comments.

**Table S.1: Commenter Index** 

Last Name	First Name	Organization	Public Concern Number				
			1 ubite Concern Number				
	Commenters on Draft – no highlight  Commenters on Supplement – grey highlight						
Commenters on Supplement – grey inginight  Commenters on Both Draft and Supplement – crosshatch highlight							
Adams	Brent		AT31, AT37, LR10, RC25				
Adams	Bruce		LR13				
Aks	Howard		RN7				
	George &						
Alderson	Frances		HD1, RWA6				
Alexander	Madie		RN7				
Allard	Wayne	U.S. Senate	CP14, TW10,WA45				
Allison	Lesli		FF14, MN29				
Allison	Miscelle		CC1, CP9, CP12, FF12, RC13, RW6, WA30				
	Don & Marilyn						
Anderson	McCord		IV2				
Anderson	Lynn		AQ38/PP12/PP13				
Annala	Loretta		HD1, RWA1				
Anonymous			RN7				
Atwater	Dennis	Southwest Public Lands Coalition	AT14/CP15				
Bachman	Don		MA1				
Baker	William		FF15				
Baker	Keith		AT36				
Barlow	Kevin & Paulette		RC25				
Bausch	Robert		MN23, TW32				
Begay	Timothy	Navajo Nation	HC7				
Belles	Mark	,	RC48, RC49				
Birtcher	Normand	Western Excelsior Corp.	CC1, ID2, IR10, TM11, TW29,				
Blackmer	Jason	SWCO Livestock Association	CC1, LR15, LR30, RC5, WS8				
Blake	Seana		RWA1, RWA5				
		U.S. Environmental	,				
Bohan	Suzanne	Protection Agency, Region 8	AQ27, AQ29, AQ30, AQ36, AQ37				
Bove	Clifford		TE14				
Brewer	Doug		RC5				
Brill	Aaron		RC30, RC32				
Britton	Rhonda		AT33				
Brown	David	BP America Prod. Co.	AQ1, AQ8, AQ9, AQ13, AQ17, AQ18, AQ19, AQ39, AQ41, MN3, MN12, MN14, MN17, MN21, MN32, MN36, RC50, RW8, SV9, WA23, WA42, WA46				
Brown	Gerald		RWA4				
Brown	J. Paul		RC5, TW10				
Brown	Mike		RWA4				
Carroll	Michael	Wilderness Support Cent., Wilderness Society	CP13, WA4				
Cassias	Pearl	Southern Ute Indian Tribe	ED8, TW45				

Last Name	First Name	Organization	Public Concern Number
	Draft – no highlight	- U	
	Supplement – grey l		
		olement – crosshatch highli	ght
Churchwell	Ту	Trout Unlimited, Five Rivers Chapter	TW3, WA47
Clark	Matthew	Trout Unlimited	AE24, AQ23, ED7, ED8, ED9, MN41, MN49, MN72, TW34, WA49
Cochran	Michael		RWA1
Colyer	Marilyn		CC1, FF9, TE7, TW15
Crawford	Jan		AE15, AE18, AQ7, AT7, IV7, LD5, LD16, LR33, MN33, RC3, TM27, WA33, WA40, WA41, WH2
Crawford	Margaret		AQ1, MN23
Crocker-Bedford	Cole & Kara- Lynn		AT11, AT34, LD13, MA2, SO4
Cummins	Chris	Saddleback Ranch	WS8
Dayzie	Sam		MN23
Derck	Gary	Durango Mountain Resort	AE1, AE8, AE13, IR9, RC33, RW3, RWA11, SV11, SV5, WA13, WA17
Dey	Eileen	Conoco Phillips	MN38
DiLeo	Jim	Colorado Department of Public Health and Environment	AQ27, AQ38, MN77
Donovan	Dianne & Joe Griffith		AQ36
Dossey	Randy	Sheep Mt. Guides & Outfitters	RN7
Drew	Deanna	Rico Alpine Society	RC46
Eckhardt	Cheryl	National Park Service	HC11
Eden	Kari		AT22, PP1, RC2
Estelle	Beth		RWA3
Farny	Dave		RN7
Farny-Mallette	Cindy		RN7
Fearn	Stephen		WS4
Felton	Jim		AC4, AQ1, AQ4, AQ5, AQ12, AQ17, AQ21, AQ41, AT2, AT4, ED11, HC1, HC6, IR6, IR8, IR14, MN4, MN17, MN22, MN37, MN38, MN39, MN62, PP2, PP4, SS1, SV2, SV4, SV7, TW12, TW18, WA19, WA34, WS4
Fishering	Nancy		CC1, ID2, TM11
Fitzgerald	Janine		CC1, CC4, HC2, HD3, HD4, HD5, HD6,MA5, RN5, TE9
Fitzgerald	Theresa		HD1, PP11, WA12
Flaugh	Lisa		AT21, AT26
Fleming	Tim		RWA3
Flynn	Conor		RWA1, WS8
Foutz	Leeann		PP1, RC2
Fowler	John	Range Improvement Task Force	AC9, LR1, LR12, LR13, LR15, LR16,LR19, LR20, LR22, LR29, TW29, WA24, WA41
Franklin	Judith		RC14, RC17
Frantz	Nona		AT19
Frost	Clement	Southern Ute Tribal Council	HC3, HC5, LR28

Last Name	First Name	Organization	Public Concern Number			
Commenters on I						
Commenters on S	Commenters on Supplement – grey highlight					
Commenters on I	Both Draft and Sup	plement – crosshatch highli	ght			
Frost	Kit		RWA3			
Fujimoto	Shirley & Kevin Cookler	McDermott Will & Emery	PP9			
Furtney	Seth		RWA1			
Gardel	Holley		AT36			
Gardner	Camilla		RN7			
Gervais	Paul		RN7			
Gilbert	Bill		WH3			
Gimbel	Jennifer	Colorado Water Conservation Board, Department Natural Resources	CP2, CP3, CP13, IV5, PP5, WA29			
Gogulski	Todd		RC25			
Grady	Derric		RC25			
Graham	Chloe		RN7			
Graham	Steve		AT36, CP13, RC2, RC9			
Grant	Kent	Colorado State Forest Service	AT11			
Green	Allan		RC5			
Gregory	Dani		RC25			
Grigg	Kalin		AQ36, MN8, RC45			
Grove	Debra		LD1			
Grover	Ravi		AQ43			
Gulliford Ph D	Andrew		HC4			
Guynn	Peter & Caroline		RWA3			
Hagerty	Todd		AT22, PP1			
Hall	William		AT26, ED3, RC9, TE10			
Hamrick	Dusty		RN7			
Harper	Ned		MN65			
Harrison	Randy	Intermountain Resources	TM11, TM12, TM13			
Havens	Kenneth	Kinder Morgan C02 Co.	AQ38, MA7, MN4, MN6, MN9, MN22, MN24, MN73, MN74, PP2, TW18, WA51			
Hawthorne	Brian	Blue Ribbon Coalition	AT26, RC1			
Heaton	Al	Colorado Cattlemen's Association, Rangeland Stewardship Committee	CC1, LR11, LR14, LR17, LR2, LR21, LR30, PP10, TW3, WS8			
Heeter	Curtis		WA54			
Helfrich	Wayne & John	Brownstein, Hyatt, Farber, Schreck	WS8			
Hicks	Dusty		ED2, RC2, RC39			
Hill	David	Encana Oil and Gas	AQ1, AQ3, AQ12, AQ14, AQ40, ED2, ED11, MN22, MN36, MN38, MN40, MN62, SO5, SV8, SV10, TE18			
Hoch	Gregory	City of Durango	LD10			
Hogan	Tim	·	WA37			
Holm	Brent	Ridgway Ridgrunners	AT33, RC5			
Holmes	Tracey Jo	<u> </u>	WH1, WH3			
Hott	R.	San Juan Conservation District	WS10			
House	Ernest, Sr.	Ute Mountain Tribe	AQ11, CP10, RC13, WA22			

Last Name	First Name	Organization	Public Concern Number
<b>Commenters on</b>	Draft - no highlight		
<b>Commenters on</b>	Supplement – grey	highlight	
Commenters on	<b>Both Draft and Sup</b>	plement – crosshatch highli	ght
Hurst	Ronnie		RC7
Ivers	Dana		AQ1, MN23
Jaramillo	Clifford		AT33
Jefferies	Ned	La Plata-Archuleta Cattlemen's Association	CC1, LR11, LR12, LR20, LR23, LR27, LR31, LR32, RC5, TW2
Johnson	Roy		AQ3
Karmes	Sandra		AT19
Kemper	Douglas	Colorado Water Congress	AE1, PP6, WA20, WA21, WS6
Kibel	Julie	Dolores County	AT14, AT15
Kimball	Spencer	Independent Petroleum Association of Mountain States, Western Energy Alliance	AQ5, AQ38, ED5, LW3, MN17, MN22, MN24, MN40, MN41, MN42, MN38, MN62, TW35, WA50
Klatt	Ron		CC1, FF7, FF10, LR5, RN4, TW2
Kohin	Judith		RN7
Koppenhafer	Gerald & Larrie Rule & Steve Chappell	Montezuma County	AQ27, CP4, ED11, LR3, LR11, LR15, LR25, LR30, MA6, MN22, MN25, MN38, MN39, MN63, PP10
Korb	Julie		RWA1
Krefting	Adam		AT20, AT23
Krueger	Courtney	LaPlata County Planning Department	AQ38, AT16, AT17, TW36, WA64, WA65, WA67
Kuhlman	Ernie	San Juan County Commission	AT1
Kukuk	Janelle	Colorado Snowmobile	AT26, AT29, AT30, AT33, ED3, RC6, RC9, RC11, RN1, RN3,
Kuntz	David & Marti		AQ1, MN23
Kurlander	Scott		RWA7
Lalo	Marvin	Hopi Tribe	CP11
Lance	Christine	•	RWA1, RWA5
Landfield	Michael		MN23
Larkin	Daniel	Rocky Mt. Bighorn Society	TW10
Laur	Paul		RN6
Law	Jim		AT18, PP16, WA55, WA62, WA63, WA66, WA68
Ledgerwood	Lynn		RWA1
Lee	Brice	Colorado Public Lands Council	LR8, LR20, LR23, LR29, PP9, RC5, TW10
Leftwich	Marilyn		HD1, RWA5,
LeValley	Robbie		CC1, LR8, LR11, LR12, LR20, LR21, LR25, LR29
Libby	Sherri		RWA3
Lish	Christopher		MN23, RWA10
Littlejohn	Tony		RWA5
MacGregor	Jocko		RC23
Macomber	Clay		RC24
Mahaffey	Joe	Dolores Water Conservancy District	CP7, WS6, WS8, WS9
		Combon variety District	AT33

Last Name	First Name	Organization	Public Concern Number
	n Draft – no highlig	8	
Commenters or	n Supplement – gre	y highlight	
Commenters of	n Both Draft and Su	upplement – crosshatch highli	ght
Malarsie	George	San Juan Basin Habitat Partnership Program	LR13
Marion	Robert		RC8, RW7
Matheny	J	Questar	ED11, MN22
May	Joan	San Miguel County Commissioners	AQ27, AQ38, AT13, MN78
McGinley	Eileen		RN7
McGuigan	Sherwood	National Mustang Assoc.	MN20, WH3
Mears	Greg		AT36
Meyers	Chris	Intermountain Resources	ID2, SS1, TE19, TM11,TM12
Miller	Sandra		RWA3
Miller	Tad		AT33
Monroe	Mary	Trails 2000	CP13, RC23, RC25, RC44, WA4
Morgan	Lorri		WH3
Moseley	Claire	Public Lands Advocacy	AQ25, AQ26, AQ27, AQ28, AQ29, AQ30, AQ33, AQ34, ED4, ED6, HC9, MN15, MN19, MN23, MN62, MN64, MN71, PP3, RC5, SV1, WA51
Muire	John	Cabot Oil & Gas Corp.	AC4, AQ1, AQ3, AQ7, AQ12, AQ21, AQ42, AT2, AT4, AT11, IR7, IR8, MA3, MA6, MN5, MN16, MN22, MN24, MN27, MN38, MN39, MN62, PP2, PP4, PP18, RC41, SS1, SV3, SV4, SV7, TE16, TW12, WA19, WA35, WS4, WS15
Mumma	John		LR10, LD12, SS3
Murphy	Sheldon	Red Rocks Ranch	LR12, LR15, LR26
Newberry	Linda	Audubon, Colorado	TW21, TW26, TW27, TW28, TW29
Norton	John		PE1, PE2, RC47
Nunn	Zachary		RN7
O'Neill	Suzanne	Colorado Wildlife Federation	TW32, TW37, MN67
Osbourne	Moraan		RN7
O'Shea Heydinger	Chris		AQ1, MN23, MN68
Padden	Kevin		WA37
Paulson	Deb		MN31, TW14

Last Name	First Name	Organization	Public Concern Number
Commenters on I	Draft – no highlight		
	Supplement – grey l		
Commenters on I	Both Draft and Sup	plement – crosshatch highli	
Pearson	Mark	San Juan Citizens Alliance, Clearview Homeowners Assn.	AC1, AC2, AC3, AC5, AC6, AC7, AC8, AC10, AC12, AC14, AC15, AE2, AE5, AE7, AT7, AT8, AT12, AT38, CC1, CC4, CP5, CP13, DR1, FF4, FF6, FF11, FF12, HD2, IR1, IR2, IR3, IR5, IR12, IV6, LD3, LD6, LR2, LR4, LR6, LR18, LR24, LW1, LW2, MA4, MA5, MN2, MN3, MN7, MN26, MN28, MN30, PE2, RC3, RC4, RC8, RC26, RC27, RC28, RC31, RC34, RC37, RC40, RN5, RN7, RW1, RW4, RWA8, RWA9, RWA10, RWA13, SO2, SO6, SS2, SS5, SV6, TE3, TE5, TE6, TE7, TE8, TE12, TE13, TE14, TM1, TM3, TM5, TM7, TM9, TM10, TM15, TM16, TM18, TM19, TM20, TM22, TM25, TM26, TW11, TW14, TW17, TW20, TW21, TW22, TW23, TW27, TW29, WA4, WA37, WA47, WS14
Perlman	Rob	Colorado Ski Country USA	AE1, RC29, RC39, RW3
Petersen	David	Colorado Backcountry Hunters & Anglers	HD1, PE2, RWA8
Pfister	Allan	U.S. Fish and Wildlife Service	TW5, TW8, TW29
Pitcher	Davey	Wolf Creek ski area	ED1, RC7, RC38, RC39, RC51, WA25, WS2
Plantry	Jack		RN7
Pryer	Thalia		RN7
Pryor	Coco		RN7
Randolph	Dan	San Juan Citizens Alliance	AE27, AQ27, AQ31, AQ32, AQ35, AQ44, CC2, CP16, ED10, LR34, MN23, MN41, MN47, MN48, MN51, MN52, MN53, MN54, MN55, MN56, MN57, MN58, MN59, MN60, MN61, MN67, PP14, PP15, TE17, WA52, WA53, WA54, WA56, WA57, WA58, WA59, WA60
Redd	Heidi		RN7
Reece	Dennis		RC5
Reynolds	Richard	Colorado Department of Transportation	LD8, LD9, LD11
Rhoades	Clint		AT33
Riddle	Joelle	La Plata County Commission	CP13
Riggle	Don	Trails Preservation Alliance	AE16, AE17, AE20, AQ1, AT6, AT10, At19, AT20, AT23, AT25, CC3, ID1, PP7, PP18, RC2, RC10, RC12, RC41, RC42, RC43, RWA2, RWA12, TE19, TW31, TW43, TW44, WA26, WA36, WA43, WA44
Ritter	Jorg		AT36
Robinson	David		AT11, IV2
Robinson	Jean		CC1, TW10

Last Name	First Name	Organization	Public Concern Number
Commenters on D	raft – no highlight		
Commenters on S	upplement – grey h	nighlight	
Commenters on B	oth Draft and Supp	olement – crosshatch highli	ght
Robinson	Kristy	Conoco-Phillips Company	AE21, AE22, AE23, AQ22, AQ27, AQ38, AQ39, ED4, MN64, MN70, MN71, PP17, RW9, SO7, SO8, SO9, TW33, WA48, WA51
Robinson	Rita		RN7
Rodriguez	Latifa	Mesa Verde Backcountry Horsemen	RC14, WH3
Rogers	Kenny	Colorado Cattlemen's Association	CC1, LR8, LR20, LR23, LR29, PP9, RC5, TW10
Roybal	Julie	New Mexico Environment Department	AQ24,AQ43
Ryder	Steve	Winter Wildlands Alliance	AT27
Sanchez	David		LR2, LR19, LR20, LR22, LR26, LR29, TW29, TW42, WA24, WA41
Sanchez	Heather		CP13
Schaefer-Russell	Susie		PP1, AT23
Schaufele	Nancy		LD1, WH1, WH3
Schoonderwoerd	Leslie		AT19
Schuetz	Kathy & Russ		RC14
Schwindt	Adam		RC25
Sheftel	Janice & Adam T Reeves	Maynes, Bradford, Shipps & Sheftel, LLP	AE1, AE4, AE6, AE7, AQ13, CP6, CP7, CP14, IV2, RW6, WA13, WA18, WA19, WA24, WA27, WA28, WA31, WA33, WA38, WA39, WS1, WS3, WS4, WS5, WS6, WS7, WS8, WS9, WS11, WS12, WS13
Sherer	Jon & Kathy		RC16, RC17
Silverstein	Michael	Colorado Department of Public Health and Environment	AQ1, AQ10, AQ16
Sippy	Gaige		AQ3
Sir Jesse	Ulli		RN7
Smith	David	Bootjack Managment Co.	WS8
Snyder	Phyllis	,	LR7, LR20, PP9, RC22, WS3, WS8
Sorenson	Linda		RC5
Sperry	Joe	Colorado Woolgrowers Association	LR8, LR29, TW10
Spezże	Fhomas	CPW	AE7, AE9, AE10, AE11, AE12, AE25, AE26, AT3, AT20, AT35, ED8, IV5, IV8, LR9, SS4, MN10, MN21, MN34, MN35, MN75, MN76, PE1, SS4, TW1, TW2, TW7, TW9, TW25, TW29, TW38, TW39, TW40, TW41, WA49, WA61,
Spielman	Andrew	Wolf Creek Ski Corp	RC36, RC38, RC39
Sprung	Gary	•	RC23, RC25, RC44, RN6
Staber	Sara & B. Brinley		AT20, WH3
Stark	Jennifer		MN8, RC45
Storch	Mike		RC20
Sullivan	Tim	Nature Conservancy in Colorado	AC13, AT20, FF2, IV1, IV3, IV4, LR3, MN1, RW5, SV12, TE2, TE4, TW13, TW15, TW29

Last Name	First Name	Organization	Public Concern Number
Commenters on	Draft – no highlight		
Commenters on S	Supplement – grey l	highlight	
Commenters on	Both Draft and Sup	plement – crosshatch highli	
Sumner	Bret	Beatty and Wozniak, P.C.	AQ27, AQ38, ED6, MN38, MN41, MN42, MN45, MN46, MN66, TW35, WA51,
Sykes	Tom		TW29
Talley	Tom	San Juan Wool Growers	LR8, TW10
Taylor	Janice & B Brooks		HD1, WH1, WH3
Testa	Elizabeth	Four Corners Backcountry Horsemen	RC16, RC17, RC18, RC19
Thagard	Neil	Foundation for North American Wild Sheep	LR10
Thomas	Tom	Public Access Preservation Association	AT23, PP1, RC5
Tookey	William	San Juan County Commissioner	WA16
Troxel	Tom	Intermountain Forest Association	AQ3, AQ6, AQ15, AQ20, AT5, AT9, CC1, ED11, FF1, FF3, FF5, ID1, ID2, IR7, PP8, RN2, SO1, SO3, SO6, TE1, TE9, TE10, TE11, TE15, TE19, TM2, TM4, TM6, TM8, TM11, TM13, TM14, TM17, TM21, TM23, TM24, TM28, TW4, TW6, TW7, TW16, TW19, TW24, TW26, TW29, TW30, TW31
Tuckwiller	Ross	Theodore Roosevelt Conservation Partnership	Mn19, MN23, TW1, RWA1
Valentine	Ellen		RWA1, RWA5
Vandeman	Mike		RC22
Vandenberg	George		LR10
Vankat	Drew		RC21, RC25
Vehar	V Anthony	Vehar Law Offices	PP9
Venne	Sharon		RC14
Volger	Robert		RC18, RC19
Walsh	Patrick		RC23, RN6
Walz	Barbara	Tri-State	AT11, LD1, LD2, LD4, LD7, LD14
Warburton	Beverly		HC10, RC14
Ward	Marvin	Mineral County Commissioner	CP1, ED2, RC35
Weaver	Joan		RC22
Webber	Steven	U.S. Department of Energy	LD15
Weisbach	Philip		AT36
Weiss	Carrie	Pagosa Area Water and Sanitation District	AE3, CP3, CP13, WA14, WA15, WA32
Westmoreland	Barbara & Nelson		RW10
Whalen	Tom		RWA3
Wheeler	Karen		MN67
Whitehead	Bruce	SW Water Conservation District	CP13, CP14
Whiting	Michael		MN29
Wiese	Larry	National Park Service	AC5, AQ1, FF8, LD6, LR10, LR27, TW13

Last Name	First Name	Organization	Public Concern Number
Commenters on I			
Commenters on S	Supplement – grey l	nighlight	
Commenters on I	Both Draft and Sup	plement – crosshatch highli	ght
Wilkinson	Gary & A. Christy	San Juan Trail Riders	AT19, AT20, AT23, PP1, RC2, RC7, RC15, RC27
Winstanley	Dean	CPW	AT30, FF13
Wolf	James	Continental Divide Trail Society	IR11
Wright	Wayne		RC5
Xavier	Zita		AQ1, MN23, MN68
Young	Sandy		AT38, LR12, LR20
Zandy	Sievers		AT36
Zauberis	Lawrence		LR11, RC5
Zeller	Christi	La Plata County Energy Council	AQ25, AQ26, AQ27, AQ28, AQ29, AQ30, AQ33, AQ34, ED4, ED6, MN11, MN13, MN22, MN36, PP9
Zimmerman	Kathleen	National Wildlife Federation	MN67, MN69, TW32, TW37

**Table S.2: Public Concern Sections Index** 

<b>Letter-Abbreviations</b>	Public Concern Sections	Page
AC	Areas of Critical Environmental Concern	13
AE	Aquatic Ecosystems and Species	15
AQ	Air Quality	20
AT	Access and Travel Management	27
CC	Climate Change	33
СР	Collaboration and Public Involvement	33
DR	Dolores River Canyon	35
ED	Economics and Demographics	35
FF	Fire and Fuels Management	37
НС	Heritage and Cultural Resources	40
HD	HD Mountains	42
ID	Insects and Disease	42
IR	Inventoried Roadless Areas	43
IV	Invasive Species	45
LD	Lands and Special Uses	46
LR	Livestock and Rangeland Management	48
LW	Lands with Wilderness Characteristics	52
MA	Management Area Descriptions / Suitability Tables	53
MN	Minerals and Energy	54
PE	Perins Peak Wildlife Area	65
PP	Planning, Policy, and Process	65
RC	Recreation	67
RN	Research Natural Areas	74
RW	Riparian Areas and Wetland Ecosystems	76
RWA	Recommended Wilderness Areas	77
SO	Soils	79
SS	Special Status Species	81
SV	Scenery and Visual Resource Management	82
TE	Terrestrial Ecosystems	84
TM	Timber Management and Special Forest Products	87
TW	Terrestrial Wildlife	92
WA	Water	98
WH	Wild Horse Herd Management	108
WS	Wild and Scenic Rivers	109
WW	Wilderness, Wilderness Study Areas	112

#### **CHAPTER 4 – RESPONSE TO COMMENTS**

As described in the Content Analysis section, each public concern statement was derived from one or many individual public comments. The interdisciplinary team reviewed both the public concern and the supporting comments in the preparation of the responses. A response may be general or contain specific details that address a particular comment associated with the public concern. Interested parties may contact Mark Lambert (mblambert@fs.fed.us) if they would like to review the original letters and comments.

#### 4.1 Areas of Critical Environmental Concern

AC1 Public Concern: The managing agencies should give priority to designation of areas that meet Area of Critical Environmental Concern (ACEC) relevance and importance criteria as ACECs.

The LRMP interdisciplinary team analyzed all 22 areas that were nominated for ACEC designation, in consultation with SJNF and TRFO staff, and found that 19 areas met the relevance and importance criteria. However, as noted in the comment, not all of these areas were brought forward to be considered as potential ACECs in the FEIS alternatives (only four areas were included in the alternatives). This is contrary to BLM Manual 1613, which states, "All areas which meet the relevance and importance criteria must be identified as potential ACECs and fully considered for designation and management in resource management planning." To correct this oversight, the BLM will consider these other 15 areas as potential ACECs during a future planning effort. In the interim, the relevance and importance values identified within these 15 areas are largely protected through specific direction in the LRMP. A description of management actions and other prescriptions proposed in the LRMP that would provide protection for the relevance and importance criteria in these 15 areas is included with area evaluations in Appendix U.

- AC2 Public Concern: The managing agencies should discuss in greater detail the need for special management for each ACEC that meets the relevance and importance criteria to provide a fuller understanding of the effects of applying such management.
  Appendix U contains specific rationale to describe why some nominated ACECs that meet the relevance and importance criteria may not require special management. However, this would be more fully analyzed in a plan amendment (see response to AC1) that the BLM would prepare after the LRMP is approved.
- AC3 Public Concern: The managing agencies should expand the boundaries of special management areas to include the entirety of nominated ACECS falling partially within the special management areas' boundaries.

The boundary of the Dolores River Canyon area has been revised and includes all lands within the Snaggletooth, Dolores River Canyon, and McIntyre Canyon nominated ACECs. The Dolores River Canyon area also contains a portion of the Slick Rock nominated ACEC. This would help to "protect and prevent irreparable damage" to those areas and their relevance and importance values through direction associated with the Dolores River Canyon area.

- AC4 Public Concern: The managing agencies should identify potential ACECs by name or location in Table 3.29.1.
  - Table 3.29.1 has been deleted. The FEIS includes maps of potential ACECs by alternative, and a map is included in Appendix U displaying the location of all nominated ACECs.
- AC5 Public Concern: The managing agencies should apply special management prescriptions to all nominated ACECs to protect rare and vulnerable plant species and to protect species biodiversity.

The LRMP contains management prescriptions that protect rare and vulnerable plants and biodiversity throughout the planning area, and potential ACECs contain additional direction that would protect these values.

AC6 Public Concern: The managing agencies should include an alternative that includes the nominated ACECs to comply with the BLM manual.

BLM Manual 1613 provides direction for the designation and management of ACECs and states, "All areas which meet the relevance and importance criteria must be identified as potential ACECs and fully considered for designation and management in resource management planning." Of the 22 sites evaluated, 19 sites were found to meet both the relevance and importance criteria but only four sites were included in the Draft EIS alternatives. Those same areas, with some slight boundary modifications, are analyzed in the FEIS. The remaining 15 areas that met both relevance and importance criteria were not included in the alternatives to be analyzed as potential ACECs. To correct this oversight, the BLM will consider these other areas as potential ACECs during a future planning effort. In the interim, the relevance and importance values identified within these 15 areas would be protected through direction in the LRMP. A description of management actions and other prescriptions proposed in the LRMP that would provide protection for the relevance and importance criteria in these 15 areas is included with area evaluations in Appendix U.

AC7 Public Concern: The managing agencies should apply special management prescriptions to the nominated Little Gypsum Valley and Big Gypsum Valley ACECs to protect rare and vulnerable plant species and to protect their species biodiversity.

The Big Gypsum Valley and Little Gypsum Valley nominated ACECs have been combined (Gypsum Valley) and proposed for ACEC designation, and The LRMP includes special management prescriptions addressing rare and vulnerable plant species and biodiversity within the potential ACEC.

AC8 Public Concern: The managing agencies should designate the Snaggletooth portion of the Dolores River Canyon as an ACEC to provide protection of the area's relevant and important values and wilderness character.

Alternatives B and C include management actions that would protect wilderness characteristics found within the Snaggletooth area. Consideration of the area as an ACEC would occur during a plan amendment that would address all nominated ACECs that meet the relevance and importance criteria but were not included in one of FEIS alternatives (see response to AC1). In the interim, the relevance and importance values identified within the Snaggletooth area would be protected through other direction in the LRMP. A description of management actions and other prescriptions proposed in the LRMP that would provide protection for the relevance and importance criteria in the Snaggletooth area is included with area evaluations in Appendix U.

- AC9 Public Concern: The managing agencies should resolve the inconsistency between assertions that ACECs would not contain private lands and the identification by the managing agencies of a potential ACEC comprised partially of private lands.

  The LRMP and FEIS are clear that decisions apply only to lands and resources under the jurisdiction of the BLM or USFS, and not to private lands.
- AC10 Public Concern: The managing agencies should recognize that including the nominated McIntyre Canyon and Slick Rock Hill ACECs into the Dolores River Canyon special management area is not an adequate substitute for ACEC designation for those nominated ACECs since that special management area does not provide provisions to protect the relevant and important values (including occurrences of the canyon tree frog and a hanging garden community) in those nominated ACECs from management activities.

  The relevance and importance values identified in these areas would enjoy protection through various allocations and management actions proposed in the LRMP alternatives; however, further analysis and consideration of these areas for ACEC designation would occur during a plan amendment (see response to AC1).

AC11 Public Concern: The managing agencies should explain in the LRMP/EIS why the Preferred Alternative does not include the Mud Springs/Remnant Anasazi ACEC, which is proposed under Alternatives A and C. In addition, please provide additional support for not including the Grassy Hills and Silvey's Pocket potential conservation areas, which are proposed under Alternative C, in the Preferred Alternative based on the important plant communities they contain.

The Mud Springs/Remnant Anasazi ACEC (now named Anasazi Culture) is included in the Preferred Alternative. Grassy Hills and Silvey's Pocket potential ACECs meet both the relevance and importance criteria based on the important plant communities they contain (and for Silvey's Pocket, based on the two G2 ranked plant species it contains), but these potential ACECs may not expressly require additional special management attention because their relevance and importance values can be adequately protected from management activities and threats by other LRMP direction.

- AC12 Public Concern: The managing agencies should provide more accurate information regarding the nominated ACECs that were incorporated into the Dolores River Canyon Special Management Area because the locations and proposed management themes are misleading and the Little and Big Gypsum Valleys are not adequately protected.
  The boundary of the Dolores River Canyon area has been revised and includes all lands within the Snaggletooth, Dolores River Canyon, and McIntyre Canyon nominated ACECs. The Dolores River Canyon area also contains a portion of the Slick Rock nominated ACEC.
- AC13 Public Concern: The managing agencies should protect Gunnison sage-grouse by applying special management prescriptions to the San Miguel Basin ACEC. The LRMP contains a number of standards, guidelines, lease stipulations, and other direction that provide protections for Gunnison sage-grouse. The San Miguel Basin nominated ACEC may not require special management attention to protect Gunnison sage-grouse because of the general protections afforded under the alternatives. This would be further assessed in a plan amendment to address all nominated ACECs that were not carried forward for analysis (including San Miguel Basin) in the FEIS alternatives (see response to AC1).
- AC14 Public Concern: The managing agencies should propose all of the eight ACECs nominated jointly by the Center for Native Ecosystems and San Juan Citizens Alliance for designation because these areas meet the ACEC criteria.

The LRMP interdisciplinary team analyzed the eight areas that were nominated for ACEC designation by the San Juan Citizens Alliance and the Center for Native Ecosystems and found that they all met the relevance and importance criteria. Because they were not brought forward to be considered as potential ACECs in the EIS alternatives, the BLM would develop a plan amendment that fully considers these areas as potential ACECs. In the interim, the relevance and importance values identified within these eight areas are largely protected through specific direction in the LRMP. A description of management actions and other prescriptions proposed in the LRMP that would provide protection for the relevance and importance criteria in these eight areas is included with area evaluations in Appendix U.

AC15 Public Concern: The managing agencies should clearly disclose when an area is not being considered for ACEC designation because other uses have been prioritized over protection of relevant and important values in a nominated ACEC.

The LRMP alternative themes address various priorities and emphases for managing resources within the planning area, and they each place a different emphasis on protection of different uses, resources, and values. The description of the alternative themes in Chapter 2 of the FEIS provides the information and rationale behind what is proposed in each alternative.

#### 4.2 Aquatic Ecosystems and Species

AE1 Public Concern: The managing agencies should revise the habitat conservation standard for Colorado River cutthroat trout.

Please see our response to Public Concern AE8 concerning "maintaining 100% of habitat" for Colorado River cutthroat trout. Maintaining populations of Colorado River cutthroat trout is a priority for the USFS and BLM. The referenced guideline applies to existing designated conservation populations. The guideline as written is consistent with the Colorado Cutthroat Conservation Agreement and Strategy of which the USFS and BLM are signatories. The intent of the draft guideline is to maintain the few populations presently in existence. The 1982 LRMP, as amended in 1992, has 40% habitat maintenance, which applies to all fish bearing streams, not just to those with Colorado River cutthroat trout. Guidelines A.2, A.2.1, A.2.2, and A.2.3 from the Draft LRMP have been revised and rewritten. See the Aquatic Ecosystem and Fisheries section in the LRMP.

# AE2 Public Concern: The managing agencies should include Measure IV.C as a standard to avoid activities that might increase the likelihood aquatic species would be listed under the Endangered Species Act.

We have included a new section in the LRMP (Section 2.1) that establishes an ecological framework for the conservation and management of ecosystems, habitats, and species. In Section 2.1, your concerns are addressed under Species Management Strategy, Special Status Species and Management Indicator Species, and Biological Diversity and Population Viability. The concepts of Guideline IV.C are woven into Section 2.1 and the Aquatic Ecosystem and Fisheries section (Section 2.5) of the LRMP. Potential impacts to threatened and endangered species continue to be handled through Section 7 of the Endangered Species Act and consultation with U.S. Fish and Wildlife Service (USFWS).

# AE3 Public Concern: The managing agencies should clarify how the criteria in Guideline A.2.3 and the Historical Range of Variation (HRV) criteria would be applied to streams allocated for water projects.

We have included a new section in the LRMP (Section 2.1) that establishes an ecological framework for the conservation and management of ecosystems, habitats, and species. In Section 2.1, your concerns are discussed and clarified under Disturbances and the Historical Range of Variability, and Ecosystem Management. Relative to Guideline IV.A.2.3, we disagree with the interpretation that using reference stream conditions is an enforcement measure for HRV. Reference stream conditions are defined as the set of selected measurements and/or conditions used as representative of the natural potential condition of a stream. The selected measurements and/or conditions describe a minimally impaired watershed or reach characteristic of a stream type in an ecoregion. These reference streams can serve as a model for the potential of a stream. Because of Section 2.1, we have removed use of "reference stream conditions" from the standards and guidelines in the Aquatic Ecosystem and Fisheries section.

## AE4 Public Concern: The managing agencies should clarify whether the HRV is being used to determine which systems are historically capable of supporting fisheries.

The LRMP does not use HRV as a means to identify "systems historically capable of supporting" fish populations. We may use several tools such as historic records to determine those streams capable of supporting fish populations. We have written a new section of the LRMP (Section 2.1) that establishes an ecological framework for the conservation and management of ecosystems, habitats, and species. In Section 2.1, your concerns are discussed and clarified under Disturbances and the Historical Range of Variability, and under Ecosystem Management.

# AE5 Public Concern: The managing agencies should concentrate monitoring of Colorado River cutthroat trout because it is more sensitive to changes in the environment than other species.

It is our intent to continue our monitoring efforts for the Colorado River cutthroat trout along with other trout species that are more widespread.

#### AE6 Public Concern: The managing agencies should revise aquatic habitat and species population requirements to comply with the 1982 Planning Rule.

Although maintaining the minimum of 50% weighted usable area as stated in the Draft EIS was intended to provide adequate aquatic habitat to maintain viable populations of all native and/or desired non-native vertebrate species, as required under the 1982 Planning Rule, we have revised and expanded Guideline IV.A.2 and A.2.2 in the Aquatic Ecosystem and Fisheries section (Section 2.5) of the LRMP. Additionally, we have included a new section in the LRMP (Section 2.1) that establishes an ecological framework for the conservation and management of ecosystems, habitats, and species. In Section 2.1, your topics are addressed under Disturbances and the Historical Range of Variability, Ecosystem Management, Species Management Strategy, Special Status Species and Management Indicator Species, and Biological Diversity and Population Viability.

AE7 Public Concern: The managing agencies should provide clearer direction for protecting aquatic resources in order to clarify how the Historical Range of Variation concept is being used, to include a definition of "sustainability," and to include how the aquatic habitats that would be maintained are determined.

We have included a new section in the LRMP (Section 2.1) that establishes an ecological framework for the conservation and management of ecosystems, habitats, and species. In Section 2.1, your topics are discussed and clarified under Disturbances and the Historical Range of Variability, and under Ecosystem Management. Maintenance of aquatic habitats is determined on a case-by-case basis, and is specific to the inherent geomorphology, flow regime, and a variety of other attributes of a stream. The LRMP does not use HRV as a means to identify "systems historically capable of supporting" fish populations. We may use several tools such as historic records to determine those streams capable of supporting fish populations. The standards and guidelines in the Aquatic Ecosystem and Fisheries section (Section 2.5) of the LRMP have been rewritten and revised to address your concerns. Please refer to the FEIS glossary for a definition of sustainability.

AE8 Public Concern: The managing agencies should replace Design Criteria A.1 with the goals of the Tri-State Conservation Agreement.

We maintain that Design Criteria A.1 is consistent with the Tri-State Agreement for Colorado River cutthroat trout. Since the East Fork Hermosa Creek is a formally designated conservation population of Colorado River cutthroat trout in the Tri-State Agreement (Objective 1 in the agreement) and the Hermosa Watershed is one of the locations for establishment of a self-sustaining meta-population with five viable but interconnected sub-populations (Goal 1 in the agreement), we believe that maintaining 100% of existing Colorado River cutthroat trout habitat is consistent with the Tri-State Agreement. For clarity, we are including all goals and objectives of the Tri-State Agreement in the desired conditions, objectives, and guidelines for Aquatic Ecosystems and Fisheries in the LRMP.

AE9 Public Concern: The managing agencies should revise the description of native warmwater fish species to accurately reflect current status and threats.

We concur that the bluehead sucker is more at risk in western Colorado than the flannelmouth sucker. However, for streams on the SJNF and TRFO, the flannelmouth sucker is equally at risk. To better reflect both situations and hybridization with white suckers, we have rewritten the two paragraphs in the FEIS. Please see the Aquatic Ecosystems and Fisheries section of the FEIS.

AE10 Public Concern: The managing agencies should include local efforts among the reasons why the Colorado River cutthroat trout was not listed by the USFWS.

We concur and have included the wording suggestions. Please see the Aquatic Ecosystems and Fisheries section of the FEIS.

AE11 Public Concern: The managing agencies should correct statements related to current fish stocking efforts because many streams have self-sustaining populations of rainbow and cutthroat trout.

We concur and have included the wording suggestions. Please see the Aquatic Ecosystem and Fisheries section of the FEIS.

- AE12 Public Concern: The managing agencies should correct statements related to declining trout populations to reflect declining trout populations in areas with altered hydrology.

  We concur and have included different wording in the Aquatic Ecosystem and Fisheries section of the FEIS.
- AE13 Public Concern: The managing agencies should revise the conclusions related to impacts on cutthroat trout because they are not based on scientific data and conflict with the Durango Mountain Resort EIS.

Please see our response to Public Concern AE8 concerning "maintaining 100% of habitat" for Colorado River cutthroat trout. The "likely to impact" statements in the Draft EIS have been removed and we have revised the Biological Evaluation. Please see the standards and guidelines in the Aquatic Ecosystem and Fisheries section of the LRMP, the Aquatic Ecosystem and Fisheries section of the FEIS, and the Biological Evaluation.

AE14 Public Concern: The managing agencies should clarify how road densities relate to all other anthropogenic disturbances in highly disturbed watersheds.

The highly disturbed watershed analysis considered many impacts in addition to roads and road density. These watersheds may also include anthropogenic disturbances associated with logging, recreation, urbanization, minerals development, and water uses. It is not accurate to assume that roads are the only anthropogenic disturbance in these watersheds. However, if a watershed has a high level of anthropogenic disturbance, and also has a high level of existing impacts from the transportation network, continuing to increase new road construction would likely not contribute to watershed recovery.

AE15 Public Concern: The managing agencies should include restrictions on activities that cause sedimentation, water temperature increases, or changes in water chemistry to protect aquatic invertebrates and aquatic ecosystems.

We have revised and rewritten the Aquatic Ecosystem and Fisheries section of the LRMP (especially the standards and guidelines) to better address population viability of fisheries. Your suggestions have also been incorporated into the LRMP at Section 2.1 (Ecological Framework and the Conservation of Species) of the LRMP.

AE16 Public Concern: The managing agencies should remove off-road vehicles from the list of multiple-use activities that have the potential to impact aquatic ecosystems because no evidence is provided that they do have an effect.

Based on personal observations and experience on the SJNF and TRFO by several resource specialists, off-road vehicle use has some potential to impact some aquatic ecosystems. However, trail-based recreation impacts were removed as threats to the three warm-water sensitive fish species or the Colorado River cutthroat trout.

AE17 Public Concern: The managing agencies should acknowledge that trail-based motorized recreation does not have a significant impact on flannelmouth sucker or Colorado River cutthroat trout.

We have added language to the Biological Evaluation that trail-based recreation does not pose any threat to the three warm-water sensitive species or Colorado River cutthroat trout.

AE18 Public Concern: The managing agencies should include recreation, oil and gas development, and salable mineral removal in the list of activities that could affect aquatic ecosystems.

Potential impacts from management of these programs have been included in the revised Aquatic Ecosystems and Fisheries section of the FEIS.

AE19 This Public Concern is captured by Public Concern PP18

#### AE20 Public Concern: The managing agencies should support the assertion that road obliteration would benefit aquatic and riparian systems.

Road closures and obliteration on the public lands in southwest Colorado have been shown to be effective in improving aquatic habitat and reducing sediment loading to streams. Box Canyon Creek, tributary to the Mancos River on USFS lands was impaired from sediment derived in large part from high road densities in the watershed. The U.S. Environmental Protection Agency (EPA) conducted aquatic and sediment surveys after USFS watershed-wide road closures, obliteration, and road stabilization. The EPA found measurably improved aquatic habitat and reduced stream sediment loads in sufficient amounts to remove the stream from the Colorado 303(d) list of impaired streams. This example is more local than Redwood National Park, which is in a very wet coastal climate regime. See <a href="http://water.epa.gov/polwaste/nps/success319/co">http://water.epa.gov/polwaste/nps/success319/co</a> box.cfm.

## AE21 Public Concern: The managing agencies should perform a more adequate analysis of cumulative effects for aguatic ecosystems and fish species.

The analysis in the Supplement was a product of the projected oil and gas well development in the GSGP and the subsequent projected water usage with that development. Please refer to the Aquatic Ecosystems and Fish Species section of the FEIS which addresses cumulative effects of all proposed actions in addition to the oil and gas projections.

AE22 Public Concern: The managing agencies should clarify that only acre-feet of water not previously consulted on with the USFWS are subject to a formal consultation, whereas those already consulted on are considered part of the environmental baseline for listed fish evaluated in the Biological Assessment.

For these particular river basins, we generally assume that the water sources were not consulted on with the USFWS previously; hence, the consultation now. However, where previous consultation with USFWS has occurred, the anticipated water depletions with the Gothic Shale Gas Play (GSGP) development would likely exceed the previously consulted water amounts, and formal consultation with the USFWS would again be required.

AE23: Public Concern: The managing agencies should correct inconsistencies in the number of wells drilled and water depletion in drainage basins on the USFS and BLM lands and also correct inconsistencies in the Aquatic Ecosystems and Water sections.

Although the sources of water from private lands for the GSGP well drilling and completion are unknown, it would either occur in the San Juan River Basin or Dolores River Basin. The managing agencies assumed that the water to be used for well drilling and completion on public lands that come from private lands would generally come within the river basin where the well is being drilled. Appendix F discloses the agencies' best estimate of impacts by river basin. These assumptions and estimates are repeated or summarized in the Water and Aquatic Ecosystems sections of the FEIS. Although the Water section did not display the same effects analysis in the Supplement to the Draft EIS as in the Aquatic Ecosystems section, specialists did compare and coordinate their water depletion calculations and analysis in the FEIS.

AE24: Public Concern: The managing agencies should increase the No Surface Occupancy (NSO) buffers around streams and rivers to protect fisheries.

Due to the location of stream segments with existing greenback cutthroat trout and Colorado River cutthroat trout, the 0.25-mile NSO buffer is adequate to protect these populations. This stipulation includes a modification in which site-specific conditions may allow more discretion by the land manager. Additionally, a 325-foot NSO stipulation around all perennial streams to protect water quality and aquatic ecosystems, including coldwater fisheries, has been developed. Around major rivers, a 2,500-foot NSO stipulation would be imposed in the GSGP.

AE25: Public Concern: The managing agencies should perform a more detailed analysis of potential adverse cumulative impacts from increased sedimentation on fish species such as the mottled sculpin and speckled dace.

In addition to best management practices (BMPs), we would require a 325-foot NSO stipulation around all perennial streams and a 2,500-foot NSO stipulation along major rivers (water and soils

related stipulations) for leases in the GSGP. Our intent is to minimize adverse effects of erosion and sedimentation on water quality and aquatic ecosystems, including benthic dwelling aquatic fisheries such as the mottled sculpin and specked dace. A more detailed inventory and analysis of benthic dwelling aquatic fisheries may be considered at the project level.

AE26: Public Concern: The managing agencies should include a discussion of potential adverse impacts from water depletion and increased sediment from GSGP development on stream systems with fish populations in McElmo and Yellow Jacket Canyon.

A discussion of water depletion-related impacts on these stream systems has been added to the FEIS. Please refer to the Aquatic Ecosystems and Species section.

AE27: Public Concern: The managing agencies should proceed with a Biological Assessment and coordination with the USFWS and discuss when a Biological Assessment is appropriate.

Although not a cooperating agency, formal consultation with the USFWS has occurred with respect to water depletion associated with oil and gas development in the GSGP. Most USFS and BLM projects occur with informal consultation with the USFWS. Because all water sources within these river basins have not had USFWS consultation for water depletion, we generally assume any discretionary water depletion that is connected to federal actions would trigger formal consultation with the USFWS. If we discover that a water source has undergone consultation, the previously consulted allowances for water depletion have not been met, and estimates for water depletion with proposed projects stay within the approved water allowances, then no additional formal consultation is required. Informal consultation and coordination would still occur. However, when the anticipated water depletions, such as with the GSGP development, would likely exceed the previously consulted water amounts, then formal consultation with the USFWS would again be triggered.

#### 4.3 Air Quality

AQ1 Public Concern: The managing agencies should revise the discussion of air quality monitoring.

In response to public comment, the air quality analysis has been greatly expanded and a new air quality model (CALPUFF Air Pollution Dispersion model) was used. The result of this analysis was made available for public comment and review in August 2011 in the Supplement to the Draft EIS and is included in the FEIS. The new analysis includes detailed well development scenarios, accurate well counts, monitoring data, emissions inventory, and uses a reasonable foreseeable development (RFD) scenario instead of the worst case scenario. New air quality analysis also uses the appropriate National Ambient Air Quality Standards (NAAQS), including revised ozone standards. Additional detailed information about the model, software, and data can be found in the Air Quality Analysis Technical Support Document.

- AQ2 Public Concern: The managing agencies should include information regarding the Clean Water Act Section 402 permitting program and indicate that the Colorado Department of Public Health and Environment (CDPHE) is generally the National Pollutant Discharge Elimination System (NPDES) permitting agency for the planning area.
  - The LRMP should not repeat laws, regulations, and policies if at all possible. Applicable laws and regulations are summarized in Additional Referenced Guidance in the Water section of the LRMP.
- AQ3 Public Concern: The managing agencies should revise the design criteria related to air quality because they are beyond the authority of the agencies.

The SJNF and TRFO were asked by the State of Colorado and the EPA, the state and federal regulators of air pollution, to adopt the measures listed in standard and guidelines. The Federal Land Policy and Management Act of 1976 (FLPMA) (43 United States Code [USC] 1752) requires that "public lands would be managed in a manner that would protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource and

archaeological values" (Sec. 102). Standard and guidelines for air quality protection on the SJNF and TRFO are in compliance with this act and are within the authority of the USFS and BLM.

## AQ4 Public Concern: The managing agencies should use the NEPA process to cooperate with the State of Colorado on air quality issues.

NEPA was used to disclose the impacts of a variety of alternatives that have a range of air quality impacts. In response to public comment, a more detailed air quality analysis was performed. This more detailed analysis was released for public comment in 2010. The State of Colorado was a stakeholder in the air quality analysis process and provided input for air pollutant dispersion model selection and modeling protocols. The more detailed air quality analysis performed in 2009 and 2010 in response to public comment to the EIS adequately discloses impacts to air quality to ensure a fully informed and well-considered decision. Additional site-specific analysis would be developed for projects with the potential for significant air quality impacts. Further coordination between the managing agencies and the State of Colorado would be accomplished through these NEPA processes, as applicable.

#### AQ5 Public Concern: The managing agencies should revise the air quality goal to limit action to inviting the CDPHE to participate as a cooperating agency.

While regulatory authority under the Clean Air Act has been delegated from the EPA to the CDPHE in establishing regional standards, the application to public lands is well recognized in both FLPMA and the National Forest Management Act (NFMA) to require the agencies to recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources. In southwest Colorado the regional implications in setting desired conditions and outcomes is a critical planning issue required by both the USFS Planning Manual and BLM Land Use Plan Handbook to be addressed in the LRMP.

# AQ6 Public Concern: The managing agencies should make the air resources objective more tangible to ensure the agencies are not responsible for actions and events beyond their control.

Air pollution and the resulting impacts are often beyond the control of the SJNF and TRFO. Much of the long-term monitoring and modeling performed by the SJNF and TRFO can differentiate between local pollution sources and long range pollution transport. Planning area monitoring and modeling of Class I areas is critical for USFS and BLM participation in the Clean Air Act New Source Review and Prevention of Significant Deterioration (PSD) permitting processes, participation in the Four Corners Air Quality Task Force, and through the authorization of land use activities occurring on the SJNF and TRFO. Monitoring is a critical way to ensure the USFS and BLM are fulfilling air quality protection obligations for Class I areas. Monitoring using standard air quality objectives to determine the impacts to standard Class I air quality resource values (AQRVs) are reflected in the monitoring strategy of the LRMP.

## AQ7 Public Concern: The managing agencies should revise the objectives in A2-A4 because they are not achievable within the authority of either the USFS or BLM.

The Clean Air Act of 1977 legally mandated the PSD of AQRVs on wilderness lands. The USFS is assigned the task of protecting these wilderness values. The AQRVs listed in the objectives are standard for federal land managers such as the USFS. Objectives for air quality are within the legal mandate of the Clean Air Act as assigned to the USFS.

- AQ8 Public Concern: The managing agencies should modify Objective A.4 to reduce confusion.

  Objectives regarding air quality have been revised for accuracy and clarification. Please refer to the Air Quality section of the LRMP.
- AQ9 Public Concern: The managing agencies should define "continuous" as it relates to dust abatement.

LRMP components regarding air quality have been revised for accuracy and clarification. Please refer to the Air Quality section of the LRMP.

#### AQ10 Public Concern: The managing agencies should ensure that the cumulative air quality impacts are accurately and fully described and analyzed.

In response to public comment, air quality analysis was greatly expanded and a new air quality model was used. The results of this analysis can be found in the LRMP and FEIS. Additional information can be found in the Air Quality Analysis Technical Support Document. The emissions inventory was expanded and includes the RFD and development in the San Juan Basin.

## AQ11 Public Concern: The managing agencies should participate in local air quality monitoring and air impact mitigation to protect air quality and tribal resources.

The air quality monitoring program has the dual goal of tracking air quality in Class I areas and ambient air quality for human health and the environment. New emphasis on monitoring ozone and mercury would continue. A new ozone monitoring station was installed in 2010 in Norwood, Colorado, to fill a data gap for the southwestern part of Colorado. Long-term monitoring of air resources and associated AQRVs for Class I areas would continue. The Class I area monitoring includes high lakes chemistry, NADP, and IMPROVE monitoring. The SJNF is an active member of the Four Corners Air Quality Task Force, an important regional air impact mitigation group and plans to continue long-term participation. The SJNF would continue working cooperatively with the tribes on air quality issues.

#### AQ12 Public Concern: The managing agencies should revise the Draft EIS to reflect that the 1-Hour Ozone Standard was revoked by the EPA to provide accurate information about potential exceedances of the ozone standard.

In response to public comment, the air quality analysis has been greatly expanded and a new air quality model (CALPUFF Air Pollution Dispersion model) was used. The result of this analysis was made available for public comment and review in August 2011 in the Supplement to the Draft EIS and is included in the FEIS. The new analysis includes detailed well development scenarios, accurate well counts, monitoring data, emissions inventory, and uses an RFD scenario instead of the worst case scenario. New air quality analysis also uses the appropriate NAAQS, including revised ozone standards. Additional detailed information about the model, software, and data can be found in the Air Quality Analysis Technical Support Document.

# AQ13 Public Concern: The managing agencies should correct the discussion of other pollutants to correctly identify pollutants, measures for controlling air quality, and the appropriate regulating bodies.

The air quality section would be revised to add "oxides of nitrogen and sulfur;" however, ammonia is a pollutant of concern, and nitrogen and sulfur atmospheric deposition are also of great concern for Class I areas. These compounds are not oxides of nitrogen and sulfur, and are air pollutants. The typographical error in PSD was changed from "serious" to "significant." Objectives for air pertain only to the SJNF and TRFO and to no other land ownership, except where activities that produce air pollution on the SJNF and TRFO may affect the air quality of other land ownership, e.g., nearby national parks with Class I areas such as Mesa Verde National Park. The typographical error for PSD has been corrected.

## AQ14 Public Concern: The managing agencies should ensure air quality requirements are applied equitably to all construction in the planning area.

All LRMP components for air quality have been revised for accuracy and clarification. These components address air quality protection across all the SJNF and TRFO for all activities, including oil and gas development.

#### AQ15 Public Concern: The managing agencies should clarify how they would estimate the impact from wildfires on natural background air quality conditions.

Pristine was changed to "natural conditions." Natural conditions are defined in the Federal Land Managers' Air Quality Related Values (FLAG) Phase I Report Appendix 2.B for the Weminuche wilderness Class I area. The goal is to protect natural air quality conditions (conditions substantially unaltered by humans or human activities) in the Weminuche wilderness Class I area. Natural conditions are measured directly through air quality monitoring; they are measured

indirectly using AQRVs. AQRVs for the Weminuche wilderness Class I area are lake chemistry, soil chemistry, flora and fauna assemblages, atmospheric deposition and chemistry, snow chemistry, and visibility. Natural conditions include the effects of wildfire.

AQ16 Public Concern: The managing agencies should acknowledge that oil and gas development can cause significant ozone formation.

Ozone formation is discussed in the FEIS. Please refer to the Air Quality section.

AQ17 Public Concern: The managing agencies should clarify the limits of their authority over visibility impacts under the Clean Air Act to acknowledge that they cannot regulate oil and gas facilities' emissions.

The State of Colorado and the EPA, the state and federal regulators of air pollution, requested that the SJNF and TRFO adopt the measures listed in standard and guidelines. FLPMA requires that "public lands would be managed in a manner that would protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource and archaeological values..." (Sec. 102). Standard and guidelines for air quality protection on the SJNF and TRFO are in compliance with this act.

- AQ18 Public Concern: The managing agencies should provide justification for the proposed values for visibility impairment because the suggested thresholds are not typically used. The levels of concern for visibility impairment are defined in the FLAG Phase I Report D. 2. Visibility, Levels of Concern for Class I areas including the Weminuche wilderness. The levels of concern are standard for all Class I areas managed by the USFS, National Park Service (NPS), and USFWS.
- AQ19 Public Concern: The managing agencies should provide references that support guideline thresholds for acid deposition.

The reference used is the FLAG Workgroup Phase I Report (FLAG 2010)

AQ 20 Public Concern: The managing agencies should clarify that short-term reductions in air quality are consistent with natural conditions and are an acceptable trade-off for the resulting long-term forest health.

Pristine was changed to "natural conditions." Natural conditions are defined in the FLAG Phase I Report Appendix 2.B for the Weminuche wilderness Class I area. The goal is to protect natural air quality conditions (conditions substantially unaltered by humans or human activities) in the Weminuche wilderness Class I area. Natural conditions are measured directly through air quality monitoring; they are measured indirectly using AQRVs. AQRVs for the Weminuche wilderness Class I area are lake chemistry, soil chemistry, flora and fauna assemblages, atmospheric deposition and chemistry, snow chemistry, and visibility. Natural conditions include the effects of wildfire. Tradeoffs between short-term air quality impacts from fires managed for fuels reduction and long-term forest health would need careful consideration in order to avoid large smoke impacts associated with catastrophic wildfire.

AQ21 Public Concern: The managing agencies should clarify that the agencies do not have authority over air quality under the Clean Air Act and cannot therefore regulate oil and gas emissions.

The SJNF and TRFO cooperate with State of Colorado and the EPA in air quality protection, which are acknowledged as the state and federal regulators of air pollution to protect air quality on the SJNF and TRFO. FLPMA requires that "public lands would be managed in a manner that would protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource and archaeological values" (Sec. 102). Standard and guidelines for air quality protection on the SJNF and TRFO are in compliance with FLPMA and are within the regulatory authority of the USFS and BLM.

AQ22 Public Concern: The managing agencies should analyze long-range transport of ozone and other pollutants.

Long-range transport of ozone and ozone precursors is beyond the scope of this analysis. The CALPUFF model used for the air quality analysis used an emission inventory developed from within the modeling domain. The impacts disclosed in this analysis were from sources within the modeling domain as depicted in the FEIS Air Quality section. It is true that other larger photochemical modeling efforts, (i.e. the New Mexico Environment Department 2009 modeling effort referenced on in the Supplement to the Draft EIS) did account for long-range transport of ozone and ozone precursors.

# AQ23 Public Concern: The managing agencies should improve the discussion of air quality effects on aquatic ecosystems and include the EPA requirements for associated toxic chemicals.

The managing agencies conducted a careful analysis of the potential air quality impacts to deposition and acid neutralizing capacity of water bodies sensitive to changes in chemistry from atmospheric deposition. The effects to water chemistry were analyzed using sensitive water bodies where baseline and trend monitoring exists and changes in chemistry from air quality impacts can be measured as required by USFS/NPS/USFWS protocols.

## AQ24 Public Concern: The managing agencies should update emission inventories used for modeling.

The emissions inventories for the San Juan Generating Station and Four Corners Power Plant were supplied by the State of New Mexico (and from other states for other permitted pollution sources). The most recent emissions inventories available at the time of air dispersion model execution were used for this analysis.

#### AQ25 Public Concern: The managing agencies should include detailed information and data regarding emissions.

Detailed emissions information is available in the Air Quality Technical Support Document, which is available by request.

#### AQ26 Public Concern: The managing agencies should not include refineries as a source type for emissions.

New refineries were not considered as a reasonably foreseeable action or as part of the Proposed Action. Refineries with state permits may have been included in the emission inventories provided by the state agencies as used in the CALPUFF model.

## AQ27 Public Concern: The managing agencies should revise the air quality mitigation options and require all available options to reduce emissions.

Air quality regulatory agencies require that definitive mitigation measures be developed and analyzed to mitigate the air quality impacts. As a result of public comment, the air quality mitigation options were revised and some new options were added. It is anticipated that several mitigation options in combination would be necessary to achieve the desired reduction in project emissions. The final mitigation options selected for air quality protection can be found in the Air Quality section of the Final LRMP and FEIS and are stated as part of the selected alternative in the Record of Decision (ROD).

#### AQ28 Public Concern: The managing agencies should include a discussion of mid-field air modeling results.

The analysis follows the guidelines set forth in the NEPA Air Quality Memorandum of Understanding (MOU) for Federal Oil and Gas Decisions (2011). This MOU between the U.S. Department of Agriculture (USDA), the U.S. Department of the Interior (USDI), and the EPA establishes a framework and a set of procedures that the five participating agencies would use to analyze and mitigate potential impacts associated with oil and gas development on federal lands to air quality and visibility, as well as other AQRVs. In addition, the modeling protocol was developed with the assistance of a stakeholder group consisting of the EPA, CDPHE, NPS, USFS, and BLM. Specific analysis of mid-field air quality impacts is not required for this project.

#### AQ29 Public Concern: The managing agencies should update the discussion of ambient ozone standards.

Clarification of the current ozone NAAQS have been added to the FEIS. The affected environment ozone discussion has also been updated for clarification. The USFS has developed a list of plant species sensitive to ozone damage to be used for monitoring environmental ozone impacts on national forests (FLAG 2010). The SJNF and TRFO have initiated ozone foliar damage monitoring; see <a href="http://www.mountainstudies.org/index.php?q=content/ozone-bio-monitoring-project-assessment-vegetation-signs-injury-due-ozone">http://www.mountainstudies.org/index.php?q=content/ozone-bio-monitoring-project-assessment-vegetation-signs-injury-due-ozone</a>

AQ30 Public Concern: The managing agencies should revise tables to include accurate EPA 2012 NAAQS and ensure modeling reflects  $NO_2$  and  $SO_2$  1-hour concentrations.

Tables have been revised and updated to EPA 2013 NAAQS. The modeling did reflect NO<sub>2</sub> and SO<sub>2</sub> 1-hour concentrations and was disclosed on pages 3.21 and 3.24 of the Supplement to the Draft EIS. The modeling in the LRMP and FEIS also includes these concentrations.

AQ31 Public Concern: The managing agencies should justify the greenhouse gas (GHG) emissions analysis used in the Supplement to the Draft EIS.

The GHG analysis was conducted using local GHG emissions projections, and, where available, other GHG emission information was included. Additional GHG and climate change analysis was completed for all resources for the FEIS. As land management agencies, the BLM and USFS are not yet required to formally report GHG emissions.

- AQ32 Public Concern: The managing agencies should take a hard look at cumulative GHG.

  A GHG assessment was completed for the Supplement to the Draft EIS. In addition, many of the mitigation options in the Supplement to the Draft EIS were developed to reduce GHG emissions. As a result of public comment, several additional mitigation options to reduce GHG emissions were added and are disclosed in the FEIS. Assessing the GHG emissions throughout the basin is outside the scope of this analysis because at the time the analysis was conducted, GHG were not regulated and were not consistently a part of the emission inventory data supplied by the states within the modeling domain. In addition, the SJNF and TRFO do not have the authority to apply mitigation measures to reduce GHG emissions on lands outside USFS/BLM jurisdiction.
- AQ33 Public Concern: The managing agencies should provide documentation to support the conclusion that deposition values are in excess of the significance level.
   Detailed information is provided in the Air Quality Analysis Technical Support Document. Pages 5-2 through 5-3 and 6-5 and 7-29 through 7-33, 7-72 through 7-76 discuss deposition calculations in detail. The modeling protocol is available on request.
- AQ34 Public Concern: The managing agencies should perform additional analysis to support the conclusion that the nitrogen deposition significance thresholds would be exceeded to be consistent with the Northern San Juan Coal Bed Methane Project EIS.

Northern San Juan Coal Bed Methane Project (NSJB EIS) Air Quality Impact Assessment used a different modeling protocol compared to the Supplement to the Draft EIS. The Supplement to the Draft EIS analysis follows the guidelines set forth in the NEPA Air Quality MOU for Federal Oil and Gas Decisions (2011) and as determined by a stakeholder group of EPA, CDPHE, NPS, USFS, and BLM. This MOU between the USDA, the USDI, and the EPA establishes a framework and a set of procedures that the five participating agencies would use to analyze and mitigate potential impacts associated with oil and gas development on federal lands to air quality and visibility, as well as other AQRVs including deposition. This was not a requirement of the NSJB EIS, a document published in 2006. In addition, the Supplement to the Draft EIS considered and modeled the following projects, which were not modeled in the NSJB EIS: Gothic Shale Gas Play Project, Northern San Juan Basin 80-Acre Infill project, Southern Ute Indian Tribe Programmatic Environmental Assessment 80-Acre Infill project, Jicarilla Oil and Gas Leasing EIS, and Canyons of the Ancients National Monument Resource Management Plan.

#### AQ35 Public Concern: The managing agencies should include a more robust air monitoring and air standards enforcement plan.

The SJNF has one of the most rigorous and extensive air monitoring programs among BLM and USFS units nationwide and is committed to long-term air quality monitoring. In addition, the BLM has a field inspection program to ensure compliance with required mitigation measures. Air quality monitoring currently conducted by the SJNF and TRFO has been added to the FEIS summarizing the air quality monitoring conducted by the agencies.

# AQ36 Public Concern: The managing agencies should reduce the emissions of NO<sub>2</sub> through additional required NO<sub>x</sub> emission reductions to mitigate the predicted exceedances. Although SJNF and TRFO agree that NO<sub>x</sub> reductions are warranted, this EIS is not a PSD permit and PSD increments are irrelevant to NEPA analysis. The document cited in several places "The informal PSD information presented in Table S-3.1.9 (above)" is provided at the request of the EPA who was a stakeholder in the SJNF and TRFO air quality impact analysis. Its usefulness is to better understand potential project impacts to Class I areas. Most oil and gas emission sources are not considered "PSD major sources" under the Clean Air Act, and therefore the comparison is not a formal PSD increment analysis nor is it intended to replace such an analysis. The BLM and USFS do not have the authority to conduct regulatory PSD increment analysis.

# AQ37 Public Concern: The managing agencies should revise the naming convention in the revised Air Quality Technical Support Document to be consistent with the Supplement to the EIS.

A statement was added to the FEIS explaining the difference between the naming conventions in the EIS and the Air Quality Analysis Technical Support Document. Please refer to the Air Quality section of the FEIS.

#### AQ38 Public Concern: The managing agencies should revise the air quality standards and guidelines.

Based on public comment, feasibility of development (e.g., production capacity of a well or type of well) and technology, air quality standards and guidelines have been revised. Please refer to the Air Quality section of the Final LRMP.

#### AQ39 Public Concern: The managing agencies should remove the stipulation regarding new point sources because it duplicates federal and state law.

There are no stipulations for air quality in the Final LRMP. However, there are standards and guidelines in the LRMP to protect air quality. In these standards and guidelines, the state regulation, or whichever measure is most protective, would be implemented.

# AQ40 Public Concern: The managing agencies should acknowledge that coalbed methane (CBM) wells and infrastructure are not cumulatively large sources of sulfur dioxide (SO<sub>2</sub>) and volatile organic compounds (VOCs).

The Air Quality Analysis Technical Support Document and FEIS acknowledge that natural gas development in the Four Corners region is a small, even insignificant source of sulfur pollution. However, VOCs are not an insignificant pollutant associated with the production, storage, and transport of natural gas in the area. Several stipulations and other practices have been developed to mitigate VOC emissions.

## AQ41 Public Concern: The managing agencies should correct data related to emissions from oil and gas development in Table 3.1.5

Table 3.1.5 is not included in the FEIS. The topic of this comment is discussed and displayed in the suggested context of NAAQS in the FEIS.

#### AQ42 Public Concern: The managing agencies should acknowledge that oil and gas wells and infrastructure are not large sources of air pollutants.

The FEIS Air Quality Affected Environment section now references several studies and displays graphs showing the contribution of various air pollutants to the oil and gas sector. This sector is contrasted with other pollution sources such as coal power and mobile sources.

#### AQ43 The managing agencies should consider human health impacts.

Human health and safety was not identified as an issue during scoping and was therefore not carried forward into the analysis. However, the air quality analysis has been updated to reflect the known potential effects, including consideration of effects on health. Air quality would remain within the standards established by the state.

#### AQ44 The LRMP/EIS should consider increased carbon dioxide development.

The Supplemental to the Draft EIS was completed to address the GSGP only. Development of carbon dioxide is addressed sufficiently in the FEIS; if a significant increase in potential for development of this resource occurs, the managing agencies would address the change at that time.

#### 4.4 Access and Travel Management

## AT1 Public Concern: The managing agencies should provide the criteria used to select roads for decommissioning.

The Travel Management Rule at 36 CFR 61.212 requires the USFS to define a transportation system. A project-level travel management plan determines what our transportation system is, and anything not included in the transportation system is a candidate for decommissioning. Examples may include unauthorized routes, duplicate routes, unneeded timber sale roads, and roads causing resource impacts. 43 CFR 8342 provides the BLM guidance for designating areas as open, limited, or closed, as well as the designation criteria for roads and trails. How a road is closed (decommissioned) is a based on a site by site consideration of resources. Objectives regarding travel and roads have been revised for accuracy and clarification. Please refer to the Access and Travel Management section of the LRMP.

# AT2 Public Concern: The managing agencies should revise Desired Condition 14.13 to indicate that roads and other rights-of-way are permitted to encroach on or cross streams and riparian areas.

The comment refers to what is now Desired Condition 2.13.12. Desired conditions in the Access and Travel Management section do not alter or prevent the activities that may be permitted through Section 404 of the Clean Water Act, such as the construction of roads, pipelines, or other transportation systems that may encroach or cross streams riparian areas, wetlands, or other waters of the U.S. It is the goal of these desired conditions that transportation systems do not encroach in impacting ways that would alter channel function or geometry and that do not increase sediment delivery measurably.

## AT3 Public Concern: The managing agencies should include monitoring of new road development in the transportation monitoring section.

Monitoring of new road construction is conducted at the project level rather than the plan level. Road density guidelines set forth in the LRMP for the SJNF would be used to establish maximum road densities in U.S. Geological Survey (USGS) 6th-level Hydrologic Unit Code (HUC) watersheds and in specified wildlife areas. On TRFO lands, the LRMP states that the BLM would "develop maintenance, monitoring, signing, and implementation plans during the comprehensive travel management planning process, using guidance provided in BLM *H-8342 – Travel and Transportation Handbook* for BLM routes." Projects would require an appropriate level of environmental analysis and those that would result in road density concentrations exceeding the density guidelines would require mitigation to offset possible watershed and/or wildlife impacts. Refer to Chapter 4 of the LRMP for specific travel-related items that would be monitored.

AT4 Public Concern: The managing agencies should correct the descriptions of permanent roads to exclude roads associated with oil and gas development.

The descriptions of permanent roads have been revised for accuracy and clarification. Roads for timber and oil and gas usually temporary and are administered through a special use permit. They are not open to public use.

AT5 Public Concern: The managing agencies should clarify the term "stored roads" and use it consistently.

"Stored" has been changed to "closed." The definition for "closed," "obliteration," and "decommissioning" have been added to the glossary. The design criteria for water and road density have been revised. Please refer to the Water section of the LRMP.

AT6 Public Concern: The managing agencies should revise the discussion of roads to ensure that the cited references support the assertions made.

The references have been checked and revised where appropriate to ensure they are used correctly and support the statements in the document.

AT7 Public Concern: The managing agencies should ensure desired conditions and objectives for road densities are consistent and reduce the road density for areas designated as Management Area (MA) 5 to reduce impacts on water resources.

The road density guideline has been revised to be specific to USGS 6th-level HUCs and municipal watersheds. Road density guidelines are no longer tied to MA 5.

AT8 Public Concern: The managing agencies should include a summary of the roads analysis to serve as a basis for decommissioning objectives.

On USFS lands, the roads analysis is an internal document used as supplemental reference material during the travel management planning process. It is not a decision document and not a basis for planning-level decisions or analysis. The roads analysis process has been modified to incorporate both roads and motorized trails and is now called "travel analysis." Travel analysis is a precursor to subsequent project-level travel management planning processes. Travel management plans would identify those roads and trails that would comprise the designated transportation system and would identify and prioritize roads and trails, which are not included in the transportation system, for decommissioning. For the BLM, 43 CFR 8342 provides guidance for designating areas as open, limited, or closed, as well as the designation criteria for roads and trails.

AT9 Public Concern: The managing agencies should revise the design criteria related to decommissioning roads to define the term "high," distinguish between open and closed roads, and provide for hydrologic basins that contain more than one management area. The term "high" in the guideline related to road and trail maintenance investment is defined through a process known as travel analysis. Through travel analysis, roads and trails are evaluated on a number of criteria to determine road-specific values and risks.

The term "high" in the route density guidelines has been eliminated and specific density thresholds are provided that are resource specific, rather than management area specific, with watersheds, water quality, and wildlife as the resources of concern. These guidelines would serve as one basis for analysis of future projects for the life of the LRMP. Project proposals that would result in road densities that exceed these guidelines may require project-specific mitigation. Travel management planning is the process by which the USFS and BLM would work toward meeting the route density guidelines through identifying the designated transportation system and identifying routes and priorities for decommissioning.

The term "open" is discussed in detail in the Access and Travel Management section introduction. For the SJNF, the designated transportation system consists of those roads and trails that are "open," or available for public use and which are displayed on a Motor Vehicle Use Map (MVUM). Roads not displayed on the MVUM would be "closed" to public use, but may be used for administrative purposes or authorized by contract, permit, or other written authorization. For the

BLM, the term "open" refers to an area designation or a route designation. On BLM, these areas and routes would be identified on a travel management map.

AT10 Public Concern: The managing agencies should include the number and location of all motorized trail miles to allow for assessment of impacts.

System trail and roads information can be found in the tables presented in the Access and Travel Management section of FEIS. Tables have been separated for clarity and titles have been corrected. For the purpose of the analysis in this LRMP, the decision is for motorized suitability for the SJNF and off-highway vehicle area designations for the TRFO. These tables provide a comparison of how these travel decisions would vary by alternative. The LRMP travel decisions provide a framework for a future travel management planning process. The routes identified for inclusion in the transportation system are determined at the project-level travel management planning process.

- AT11 Public Concern: The managing agencies should not establish limitations on road construction in areas that are already leased for oil and gas development.

  The USFS would manage access in areas that are already leased according to the provisions in 36 CFR 228.12.
- AT12 Public Concern: The managing agencies should verify that objectives regarding road decommissioning and soil productivity are consistent.
   Decommissioning is achieved by a variety of methods depending on the resource conditions.
   Due to the variety of conditions, we cannot achieve 100% soil productivity restoration in all areas.
- AT13 Public Concern: The managing agencies should clarify that excess road density resulting from new oil and gas roads being developed would not result in closure of any roads open to the public that would not otherwise be designated for closure.

The Supplement to the Draft EIS says road construction or reconstruction must comply with the LRMP road density guidelines, which could require decommissioning of other roads. These other roads would be identified through travel management planning, which is the process used to identify the roads that would be included in the transportation system. It is a public process that may be conducted on its own or as part of a project NEPA analysis. Following completion of this process, roads not specifically identified as part of the transportation system or roads that are not identified as being in a stored (closed) state for future administrative or permitted use are unauthorized and may be closed. Roads identified as open to the public are authorized and are not closed.

AT14 Public Concern: The managing agencies should clarify if there are any roadless areas in the Paradox Basin and whether or not development would be allowed.

The GSGP area does intersect with wilderness study areas (WSAs) and some lands to be managed for their wilderness characteristics. Road construction could occur in these areas only if tied to valid existing rights.

AT15 Public Concern: The managing agencies should clarify how areas are developed for oil and gas if roads are closed in travel management plans.

Travel management planning identifies roads needed for a variety of purposes, including resource utilization, which would be managed as part of the SJNF and TRFO transportation system. Existing roads not identified in the transportation system are not needed and become candidates for closure. Project-specific NEPA analysis would be conducted at the project level that would include identification of the transportation network needed to support the proposed project.

AT16 Public Concern: The managing agencies should acknowledge the impacts to county roads from oil and gas development on public lands.

A more detailed description of the impacts associated with increased industrial traffic would be developed. As a condition of the lease agreement/development plan, the operator would have to

comply with all federal, state, and local laws and regulations. Conditions of Approval may include obtainment of driveway permits, access permits, completion of project-specific traffic analyses, construction of required access improvements, and payment of impact fees to local governments. Construction of other related infrastructure (pipelines, power transmission lines, etc.) would also be required to comply with all applicable regulations.

## AT17 Public Concern: The managing agencies should require stipulations for county roads impact by oil and gas development.

A more detailed description of the impacts associated with increased industrial traffic would be developed. As a condition of the lease agreement/development plan, the operator would have to comply with all federal, state, and local laws and regulations. Conditions of Approval may include obtainment of driveway permits, access permits, completion of project-specific traffic analyses, construction of required access improvements, and payment of impact fees to local governments. Construction of other related infrastructure (pipelines, power transmission lines, etc.) would also be required to comply with all applicable regulations.

#### AT18 Public Concern: The managing agencies should include an estimate of impacts from industrial water trucks.

Estimated impacts from oil and gas development are included in each resource section of the FEIS. A more detailed description of the impacts associated with increased industrial traffic would be developed. As a condition of the lease agreement/development plan, the operator would have to comply with all federal, state, and local laws and regulations. Conditions of Approval may include obtainment of driveway permits, access permits, completion of project-specific traffic analyses, construction of required access improvements, and payment of impact fees to local governments. Construction of other related infrastructure (pipelines, power transmission lines, etc.) would also be required to comply with all applicable regulations.

#### AT19 Public Concern: The managing agencies should ensure trails currently open or historically open to motorized use remain open.

This LRMP identifies areas as suitable or unsuitable for motorized use for SJNF lands or as open, closed, or limited to motorized use on TRFO lands, and does not make any specific trail designations, or identify specific trails for motorized or non-motorized use. The process used to delineate areas identified as suitable/unsuitable or open/closed/limited for motorized use was based on numerous criteria, including the history of uses within the area, and is described in the Access and Travel Management section of the LRMP. There are several cases where trails that have been historically open to motorized use fall within areas identified as being unsuitable for motorized use. This may be the case where trails were built in areas where they are not ecologically or physically sustainable, where private property is being impacted, where critical wildlife corridors or habitat is being negatively impacted, where user conflicts necessitate a separation of certain uses, or any number of other reasons. However, site-specific travel management planning, which includes opportunities for public input and comment, must occur before trails that are currently open to motorized used can be designated as closed to that use.

# AT20 Public Concern: The managing agencies should clarify how suitability determinations were made, and clarify the definitions of suitable and unsuitable over-ground motorized use.

The process for determining motorized suitability is described in the Access and Travel Management Section of the LRMP.

## AT21 Public Concern: The managing agencies should not group over-snow motorized use with over-land motorized use because the impacts are different.

Impacts from over-snow and over-ground motorized travel haven been analyzed separately.

## AT22 Public Concern: The managing agencies should allow Ranger Districts and Field Offices to determine travel suitability designations.

Motorized suitability determinations are planning-level decisions and guide subsequent, route-by-route travel management planning that typically occurs at the Field Office or Ranger District level. Before individual trails or roads can be added or eliminated, additional environmental analysis must be conducted. Ranger District and Field Office personnel were inherently involved in making the travel suitability recommendations.

## AT23 Public Concern: The managing agencies should decide on motorized suitability areas as part of the travel management process.

Site-specific, route-by-route travel management decisions would be made during project-level analysis. The LRMP does make decisions on areas suitable for motorized travel; however, changes in routes within such areas would not be changed until separate route-by-route decisions have been made under a separate environmental analysis process.

- AT24 Combined with Public Concern AT20
- AT25 Public Concern: The managing agencies should identify and analyze all motorized routes within cross-country travel areas that have not been legally closed because many so-called "unauthorized" routes were created within these cross-country travel areas.
  For "cross-county travel areas" (i.e., undesignated or open areas) on TRFO lands, there has been no requirement for users to stay on routes, thus routes created via cross country travel are not "unauthorized." For the USFS, an unauthorized road or trail is defined in 36 CFR 212.1 as a "road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas." Motorized travel suitability is addressed in the alternatives. However, site-specific impacts would be analyzed in individual NEPA analyses when making site-specific decisions regarding designation of roads, trails, and areas for motorized and non-motorized uses.
- AT26 & 28 Public Concern: The managing agencies should revise the description of over-snow motorized use and clarify if over-snow motorized users are restricted to designated routes.

Some statements in the Draft LRMP/EIS erroneously implied that over-snow motorized use would generally be restricted to groomed trails. These statements have been corrected to indicate that over-snow motorized use may occur on groomed trails and cross-country, where appropriate.

AT27 Public Concern: The managing agencies should engage in winter, over-snow motorized travel planning to comply with Executive Orders 11644 and 11989.

The SJNF would do subsequent, site-specific planning and issue a decision to address over-snow use consistent with the 2005 Travel Management Rule and in compliance with Executive Orders 11644 and 11989. The TRFO would also address over-snow motorized travel as it completes travel management planning within 5 years after the approval of this LRMP. More information on subsequent planning for over-snow use can be found in the Access and Travel Management section of the LRMP.

AT29 Public Concern: The managing agencies should clarify how many acres would be closed to snowmobiling.

This information can be found in Chapter 2 of the FEIS.

AT30 Public Concern: The managing agencies should allow over-snow motorized access to the lands north of Lone Mesa State Park.

This area has been identified as severe winter range for elk, and thus would not be an appropriate area for snowmobile use. Both the USFS and Colorado Parks and Wildlife (CPW) currently enforce seasonal winter closures in this general area for the protection of elk.

AT31 Public Concern: The managing agencies should only allow hybrid skiing where unrestricted over-snow motorized travel is allowed.

If a motorized over-snow recreational vehicle is involved, the activity is restricted to routes and areas where such a vehicle is allowed.

## AT32 & 33 Public Concern: The managing agencies should provide improved winter recreation staging and parking areas.

Improvements to parking and other recreation-related facilities are site-specific actions and would be considered during subsequent implementation project planning for recreation facilities on Red Mountain Pass and other areas. This would require additional environmental analysis and opportunities for public input and comment. To facilitate this future work, the desired future conditions found under the Access and Travel Management section of the LRMP have been revised to acknowledge and address issues related to parking areas.

## AT34 Public Concern: The managing agencies should ensure that road closures do not negatively affect landowners.

Some landowners who have property within National Forest System (NFS) or BLM lands have additional rights not afforded to the general public. Road use permits and rights-of-way can be issued to allow limited or seasonal use of otherwise closed roads and private property owners' rights, as protected by laws such as the Alaska National Interest Lands Conservation Act, would be respected and resolved on a case-by-case basis. Motorized suitability within the Dolores Canyon area is addressed in the LRMP alternatives. However, site-specific impacts would be analyzed in individual NEPA analyses when making site-specific decisions regarding designation of roads, trails, and areas for motorized and non-motorized uses, and the private landowners must ensure to engage in this particular travel management analysis.

AT35: Public Concern: The managing agencies should separate route density guidelines from MA prescriptions because route density guidelines should be based on landscape applicability.

Route density guidelines have been revised and are no longer associated with MA prescriptions.

AT36: Public Concern: The managing agencies should manage motorized/non-motorized use on the southwest and northwest sides of Red Mountain Pass consistently to facilitate enforcement and to be consistent with the Grand Mesa, Uncompanyere, and Gunnison Forest Plan.

The managing agencies did consider adjacent forest plans and other land use plans in developing the SJNF and TRFO LRMP. It is desirable to manage consistently with adjacent forests and other jurisdictions; however, suitability decisions incorporate a variety of factors and there is sometimes solid rationale to justify why management of lands adjacent to one another on differing forests may not align. In the case of Red Mountain Pass, the area to the west of U.S. Highway 550 was found suitable for over-snow motorized use due primarily to the accommodating terrain and manageability of over-snow motorized use in that area.

- AT37 Public Concern: The managing agencies should clarify whether the Hermosa Creek Trail would be closed to motorized traffic under Alternative B: Preferred Alternative

  Hermosa Creek Trail remains open to motorized use under the Preferred Alternative.
- AT38 Public Concern: The managing agencies should designate the Chicken Creek drainage, West Mancos River, and Cherry Creek area as unsuitable for motorized access because the area is sensitive to anthropogenic disturbance, is a popular quiet use area, and to be consistent with the travel management plan.

The site-specific Mancos-Cortez Travel Management Decision designated non-motorized routes (such as the Chicken Creek, West Mancos and Cherry Creek Trail) and motorized routes (both roads and trails) within this landscape. Areas designated suitable for motorized travel may include specific non-motorized routes.

### 4.5 Climate Change

CC1 Public Concern: The managing agencies should analyze and consider climate change in the LRMP revision to be consistent with statements made by the Chief of the USFS, to comply with NEPA, and to allow for monitoring and adapting to changes resulting from climate change.

Analysis and consideration of climate change has been incorporated in the Chapter 3 in the FEIS for each of the resource areas as appropriate.

CC2 Public Concern: The managing agencies should include a discussion of climate change in the cumulative impacts.

A detailed analysis of climate change and climate change adaptation strategies can be found in the introduction to the Final LRMP, throughout various resources in the Final LRMP/FEIS and in Appendix G.

CC3 Public Concern: The managing agencies should eliminate the discussion of climate change.

The requirement to include climate change analysis in LRMP revision efforts can be found in NEPA Handbook 6.4.1 and Secretary of the Interior Order 3226: "Consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, and/or when making major decisions affecting [USDI] resources."

CC4 Public Concern: The managing agencies should evaluate the potential for GHG emissions. GHG emissions analysis was completed for the FEIS. Local emissions inventories (as opposed to statewide) were used for the analysis including the Baseline Greenhouse Gas Emission Profile and Forecast for La Plata County, 2008. GHG analysis covered all of the BLM and USFS lands in southwest Colorado, including the HD Mountains. Standards, guidelines, and many mitigation measures have been developed to reduce greenhouse gas emissions.

#### 4.6 Collaboration and Public Involvement

CP1 Public Concern: The managing agencies should work more closely with local governments in the planning process.

All relevant local governments were invited to be cooperating agencies for this project. The Economic, Local Government, and Demographic sections of the FEIS focused analysis on the five counties that have the greatest acreage and population associated with the planning area.

CP2 & CP3 Public Concern: The managing agencies should ensure that the Draft LRMP is consistent with the spirit of the MOUs between the agencies and the Colorado Department of Natural Resources to make sure that the criteria used by the Colorado Water Conservation Board are used to determine stream flows.

The MOU are incorporated in the LRMP as recognized guidance. Because the MOUs are subject to change and renegotiation by the state and federal agencies, the LRMP necessarily defers to such guidance that is developed to implement policy at a level outside the scope of the LRMP and, as is stated in the introduction, both USFS and BLM management is authorized and guided by many laws, regulations, and policies; none of which are reiterated verbatim in the LRMP.

CP4 Public Concern: The managing agencies should improve communication and collaboration with Montezuma County and the oil and gas industry to allow them to provide meaningful input in the development, revisions, and selection of the final alternative.

The BLM and USFS have met with interested local governments and citizens for information exchange and when requested. We are unaware of any requests from Montezuma County that we did not respond to. The BLM and USFS have had several meetings with Montezuma County (commissioners and commissions, as well as public meetings). This LRMP revision process had

an extensive public scoping process that was open to the public and included 28 public meetings in 2005. These meetings were open to everyone, and representatives from both industry and local governments did attend some of the meetings.

CP5 Public Concern: The managing agencies should consult with CPW prior to issuing oil and gas leases to ensure that stipulations applied to a given lease provide adequate protection of habitat and sensitive species.

The BLM and USFS have consulted with CPW on wildlife and related issues, including stipulations. The agencies would continue to work closely with CPW as lands are leased and oil and gas development is proposed.

CP6 Public Concern: The managing agencies should have coordinated with the Governmental Water Roundtable on the Draft LRMP and provided a pre-release copy of the LRMP to offer pre-public comments.

The Draft LRMP and EIS were made public to all interested parties simultaneously.

CP7 Public Concern: The managing agencies should acknowledge the role of the Dolores River Dialogue in coordinating field science to address Dolores River management.

The work of the Dolores River Dialogue is acknowledged and documented in Appendix D. The BLM and USFS would continue to participate in and accommodate such cooperative efforts to the extent possible under law, regulation and policy.

- CP8 Intentionally left blank.
- CP9 Public Concern: The managing agencies should consult with tribal nations, not just members of the tribe.

The BLM and USFS recognize the requirement that they work collaboratively and conduct government-to-government consultation with the 26 Native American tribes and pueblos that claim cultural affiliation with the lands managed by the TRFO and SJNF. The goal is to ensure that management issues of concern to the tribes and to the pueblos are addressed. All applicable USFS and BLM policies addressing tribal treaty rights and federal trust responsibilities would continue to be followed. The USFS and BLM would continue to recognize the unique sovereign nation status that the Native American tribes and pueblos have with the U.S. government. Individual members of any tribe may also participate in the NEPA and planning process outside the formal tribal consultation requirements.

CP10 Public Concern: The managing agencies should work with the tribes to develop consultation protocols.

The SJNF and TRFO work collaboratively with the tribes and conduct government-to-government consultation in accordance with law and agency direction. The agencies are very interested in developing consultation protocols with the tribes; however, establishing consultation protocols is outside the scope of this LRMP.

- CP11 Public Concern: The managing agencies should consult with the Hopi Tribe on selection and allocation of ancestral sites for educational and scientific uses, as well as interpretive development and public visitation to ensure that these areas are not impaired.
   Consultation with the Hopi and other tribes on these actions and other related activities would occur when they are proposed at the project level. This LRMP does not make any decision with regard to site selection or interpretive development.
- CP12 Public Concern: The managing agencies should notify and consult with the Ute Tribal Nation to comply with Executive Order 13175 and to comply with the Brunot Agreement and the Constitution.

The BLM and USFS have consulted and continue to consult with the Ute Mountain Ute Tribe, consistent with Executive Order 13175. The Brunot Agreement is cited and incorporated by reference into the LRMP and FEIS and the agencies would continue to abide by its requirements.

CP13 Public Concern: The managing agencies should extend the public comment process and increase the information provided to local citizens.

This LRMP revision process had an extensive public scoping process that was open to the public and included 28 public meetings. All meeting materials and notes were posted on the internet (and mailed if requested). Notification of the decision to extend the comment period for 45 days was published in the *Federal Register* in March 2008 (73 *Federal Register* 11860). Additional time was granted for the EPA and CDPHE to address air quality modeling concerns. Notification of additional comment period was published for the Supplement to the Draft EIS on August 26, 2011.

CP14 Public Concern: The managing agencies should further extend the comment period because the extension is insufficient to allow for development of thorough, thoughtful, and coordinated response.

This LRMP revision process had an extensive public scoping process that was open to the public and included 28 public meetings in 2005. All meeting materials and notes were posted on the internet (and mailed if requested). Notification of the decision to extend the comment period for 45 days was published in the *Federal Register* in March 2008 (73 *Federal Register* 11860). Additional time was granted for the EPA and CDPHE to address air quality modeling concerns. Notification of additional comment period was published for the Supplement to the Draft EIS on August 26, 2011.

CP15 The managing agencies did not coordinate with local governments in the development of this land management plan as required by federal and state law.

The USFS and BLM have met all legal and regulatory requirements regarding coordination with local governments and have gone well beyond basic public involvement requirements to involve local governments and the public throughout the LRMP revision process.

CP16 The managing agencies must urge additional agencies to cooperate on this project by enlisting them as cooperating agencies.

The USFS and BLM invited over 30 entities to participate as cooperating agencies during this LRMP revision effort. The Town of Rico and Montezuma County responded, requesting cooperating agency status. Montezuma County did not renew its cooperating agency status when the MOU expired in 2010. The Town of Rico has continued its status as a cooperating agency throughout the planning process.

### 4.7 Dolores River Canyon

DR1 Public Concern: The managing agencies should revise Desired Condition 42.2 to include wilderness character.

The geographic scope of the Dolores River Canyon (McPhee Dam to Dolores WSA boundary) includes a variety of landscapes and levels of development. Not specifically listing wilderness values among other resources in this section does not relieve the agency's duties under Section 201 of FLPMA to maintain an inventory of all resources. An inventory of wilderness character and values for BLM lands is presented in Appendix O, and these findings are considered among other resource values and uses within the LRMP.

### 4.8 Economics and Demographics

ED1 Public Concern: The managing agencies should include population increases in the analysis of direct, indirect, and cumulative recreation impacts.

Estimated population increases are considered where relevant in the impact analysis in Chapter 3 of the FEIS. See Section 3.30 for a comprehensive analysis of demographics and associated impacts by resource.

ED2 Public Concern: The managing agencies should revise the economic analysis to include accurate, relevant information about local counties.

The economic analysis has been revised and updated to reflect the most influential potential impacts on local economies from LRMP direction (see Section 3.29 of the FEIS).

ED3 Public Concern: The managing agencies should clarify how the economic benefit numbers were calculated to explain why non-motorized uses appear to generate greater benefit than motorized uses.

The IMPLAN modeling that was used for the economic analysis is an accepted method for use in LRMP development. Inputs to the model are based on accepted and documented assumptions. The LRMP uses the best information available and has provided sufficient discussion of the topic raised in the comment.

ED4 Public Concern: The managing agencies should revise economic and demographic estimates using 2010 Census data.

We have updated the Demographics section to include demographic data from the 2010 Census.

ED5 Public Concern: The managing agencies should revise the socioeconomic analysis to accurately illustrate the beneficial economic effects oil and gas production would have on the planning area.

A detailed list of the most important changes made to the FEIS from the Draft EIS and Supplement to the Draft EIS are included in the Economics section of the FEIS. These changes include a comprehensive revision and update of the socioeconomic analysis for the FEIS and address the issues raised in the comment. For example, we updated the data sets used in modeling to the most recent available data (2010), revised the pricing of oil and gas, and revised production estimates of natural gas, revised the analysis of economic dependency for the planning area in Colorado to include recognition of the contribution of the mining industry in terms of both employment and labor income, and revised the Environmental Consequences section to show the impacts related to oil and gas exploration and development.

ED6 Public Concern: The managing agencies must comply with legal and agency administrative requirements for addressing local dependency on resources from public lands, existing conditions, and trends, as well as impacts to those trends, income, and employment by economic sector, community infrastructure, quality of life, and land use patterns.

An analysis of the local dependency on resources from public lands is presented in the Economics section of the FEIS. Conditions and trends are provided, and detailed employment by major industry in 2010 is shown. The Local Governments section includes a further subsection titled, "Impacts to Local Government Costs," where we discuss qualitatively the state and local capacity to use impact revenues from minerals development to balance development driven impact costs. The Demographics section addresses "quality of life" and deals with land use issues and patterns as well.

ED7 Public Concern: The LRMP must include more analysis of renewable resource benefits to economic and community development.

Renewable resource benefits such as grazing, timber harvest, and recreational use are included in the analysis of benefits and costs of the provision of goods and services on the TRFO and SJNF. The analyses in the Economics, Demographics, and Local Governments sections of the EIS capture these benefits in addition to the benefits associated with oil and gas development.

ED8 Public Concern: The managing agencies must recognize the economic contributions of outdoor recreation, hunting, and angling and the potential impacts to recreation of the alternatives.

The socioeconomic analysis was comprehensively revised and updated for the FEIS. This includes the update of recreation use estimates and spending profiles. All types of recreation were updated, from wildlife-related activities such as hunting to downhill skiing. In addition to these changes, willingness-to-pay values by recreationists used in the calculation of present net value were updated to the most current values used by the agency. All updates were used in the analysis of current conditions and impacts of alternatives. Recreation specialists determined that recreation use would not change among alternatives, and the impact analysis reflects this determination.

- Public Concern: The managing agencies should disclose the negative impacts of boom-and-bust cycles of oil and gas drilling to community lifestyles and economic sectors.
  The assumption made for planning purposes is that natural gas field exploration, development, and production would expand over the planning horizon under all alternatives, assuming that land is made available for leasing, is leased, and that market conditions support actual exploration, development, and production. Projected oil and gas development and production account for the largest difference in impact to employment, population, and local government revenue among the LRMP alternatives.
- ED10 Public Concern: The LRMP must adequately consider the private sector economics of exploration and production in the GSGP, and this information must be sufficiently incorporated into the RFD.

The economics of exploration and production is not the subject of this LRMP, which instead focuses on the identification of lands that may be made available for oil and gas leasing and on the manner of lease stipulations that may be required to conduct exploration, development, and production in an environmentally sound manner. The economics of exploration and production is a private sector consideration that may lead to requests for oil and gas leases in the future.

ED11 The managing agencies should revise the socioeconomic analysis.
The socioeconomic section and analysis has been completed revised; please refer to the Economics and Demographics sections of the FEIS.

### 4.9 Fire and Fuels Management

- FF1 Public Concern: The managing agencies should describe the relationship between impacts related to mechanical fuels treatment and those related to fire management. The use of mechanical fuels treatment is fire management. We use mechanical treatment a majority of the time in the wildland urban interface (WUI). Sometimes we would use prescribed fire to remove piles created by the mechanical operation, other times we would masticate the leftover material. As for defining the impacts of mechanical treatment that is an implementation-level decision that would be evaluated in the NEPA process and the LRMP is merely stating the wide range of management options to be used on federal land. We would use a variety of mechanical, prescribed fire, and possibly chemical application to treat the landscape.
- **FF2 Public Concern: The managing agencies should clearly define mechanical fuels treatment.**A definition of mechanical fuels treatment has been added to the glossary in the LRMP.
- FF3 Public Concern: The managing agencies should revisit using wildfire as a management tool to include the costs of wildland fire used in the analysis.
  Currently, there is no significant timber industry. The SJNF needs to be managed in a wide spectrum of ways; fire is one tool to be used in doing so. The SJNF is in favor of a wide variety of management styles and methods. Timber harvest would occur in areas where appropriate and achievable, and there is an industry to provide the means necessary. Due to geographic and physical barriers only a small portion of the SJNF is available for timber harvest. Forest

management needs to be landscape wide. Fire is one tool for doing this. The current situation with the timber industry is negotiation for mutual cancellation of sales, and an industry that is upside down. If in the future industry recovers it would be in the interest of land managers to allow harvest to take place and this method would then become a priority. However, now with no industry and large sections of land that are roadless and in need of management, fire is the most likely tool. Fire would not be managed haphazardly over the landscape and there would be several management parameters to allowing a fire for resource benefit to burn. After all, these are fire dependent ecosystems that fire has played a natural role in for centuries. The intent of this section of the LRMP is to show that we would be open to using fire as a tool to reintroduce natural cycles back into the ecosystem. As for the cost of allowing fire to be used as a management tool the best example is that prescribed fire operations cost less than mechanical methods. The cost of mechanically treating or using prescribed fire the ratio is generally 5:1. It is usually five times more expensive to use mechanical methods over the use of prescribed fire. The use of fire for resource benefit shows that cost is generally half that of prescribed fire.

## FF4 Public Concern: The managing agencies should indicate that they would aggressively respond to wildland fires.

Initial attack is a common phrase that has been used for decades in the fire management program to make the first evaluation of a wildland fire. At this point, the response could be in the form of an engine, aircraft, or other means. The primary mission at this point is to evaluate the fire based on weather, fuel, location, terrain, etc., and the managers objectives for fires located in that particular area. The actual response to the fire could be suppression, fire use, or a combination of both based on the LRMP and fire management plan(s). The LRMP does differentiate the appropriate management response in the Suitability section by management areas. It states rather that wildland fire managed for resource benefit is appropriate within any portion of the planning area. Just because managed fire may be desirable for any given area, it may not be appropriate at any given time. For example, allowing fire to burn may be desired if it can be managed as a low-intensity fire, but if fuel and forecasted weather conditions indicate otherwise, the fire may be suppressed; or if it is determined a fire that could be managed for resource benefit would require specific resources to assure it stays manageable and if all resources are committed to other fires in the United States, the fire may not be suppressed.

FF5 Public Concern: The managing agencies should not use prescribed fire or wildland fire where it would destroy merchantable timber, and achieving desired conditions for fire frequency and severity in cool-moist mixed conifer forests, spruce-fir forests, aspen forests, and pinyon-juniper woodlands would result in too much fire and its associated risks and costs.

The intent in using prescribed fire or wildfire for ecological benefit is not to destroy merchantable timber or to burn large amounts of the SJNF and TRFO, but to introduce a natural ecological process (fire) that would help achieve desired conditions and objectives in the LRMP (including desired conditions for fire frequency and severity in cool-moist mixed conifer forests, spruce-fir forests, aspen forests, and pinyon-juniper woodlands). Given the climatic, cultural, and ecological changes that have occurred since the reference period, it might not even be possible to recreate the fire regimes that occurred during the reference period.

FF6 Public Concern: The managing agencies should address the issue of fuels management along the private-public land boundary.

Desired conditions regarding fuels management and the WUI can be found in the Fire and Fuels section of the LRMP.

FF7 Public Concern: The managing agencies should modify the assessment of future fire activity to include the assessment of the role and effects of climate change.
Climate change information and mitigation measures are included in the LRMP and FEIS and summarized in Appendix G. It includes information on temperature trends, vegetation, and their relationship to fire. The entire climate change subject is evolving continuously and it would be extremely difficult to include specific strategies in the LRMP. On a national level, the USDA,

USDI, Association of State Foresters, and some private entities involved with fuels and fire management have published the Quadrennial Fire Review, which is a strategic assessment process conducted every 4 years to evaluate current mission strategies and capabilities against best estimates of future environment for fire management. This document is a vision of the future and guides the policies in fire management. The document is available for review on the National Interagency Fire Center website: www.nifc.gov/QFR/QFR2009Final.pdf

## FF8 Public Concern: The managing agencies should ensure that fuels management for archeological sites be carefully targeted, limited, and followed by invasive weed-control measures.

Part of our ongoing fuels program is targeting cultural sites located in dense stands of vegetation, and we are selectively thinning these areas by hand, especially areas with rock art. We plan to continue this practice, as well as the stabilization of sites that are already experiencing erosion. Larger high-intensity fires are a big concern and we have made it a practice to seed these areas with native vegetation as soon as possible, as well as, stabilization of critical cultural sites.

## FF9 Public Concern: The managing agencies should not remove old growth pinyon-juniper because of the impact on wildlife.

Fuel reductions methods in mature pinyon-juniper stands are primarily completed to protect developments in the WUI. As we have completed these treatments over the past 10 years, we have altered the methods of treatment to meet the objectives for wildlife. We have strived to seed all disturbed areas with native seed and have completed seeding on all projects indicated in the comment.

## FF10 Public Concern: The managing agencies should clarify what actions would be covered under the Appropriate Management Response (AMR).

Prior to the AMR, a wildfire could either be suppressed or put into a wildland fire use fire, but not a combination of both. The AMR is designed to allow the managing agency to manage a wildland fire with both methods. For example, if a natural fire ignition started near the WUI and it is determined the fire would likely spread toward public lands with resource benefits, then managers could suppress the fire near the WUI while allowing it to burn onto the public lands. If the fire stops providing the desired resource benefit, it could be suppressed. We would be removing the term "AMR" to fit the current nomenclature of "fire management." The terminology is to follow the role of management for resource benefit. This includes point protection, full suppression, and confine and contain type strategies.

## FF11 Public Concern: The managing agencies should resolve the inconsistency between Objective G.4 and the rest of the LRMP in regard to wildland fire use.

This objective has been rewritten for consistency and clarification. Please see the Fire and Fuels Management section of the LRMP.

## FF12 Public Concern: The managing agencies should change Desired Condition 6.17 because it is unrealistic as stated.

Desired conditions regarding fire and fuels have been revised for accuracy and clarification. Please see the Fire and Fuels Management section of the LRMP.

# FF13 Public Concern: The managing agencies should ensure that thinning of trees in the BLM lands around Lone Mesa State Park would be permitted to be consistent with the park's Forest and Fire Fuels Assessment and Mitigation Plan.

The BLM lands in and around Lone Mesa State Park are MA 3 in all alternatives. MA 3 allows for timber management for purposes other than timber production, like fuels mitigation. There should be no conflict with the treatments you describe.

FF14 Public Concern: The managing agencies should include residences and evacuation routes at the upper end of the Navajo River valley in the WUI designation because only one cluster of structures is currently designated as WUI.

The USFS and BLM would adjust the WUI designation as needed in areas where public lands and communities connect. The USFS and BLM can coordinate with local communities to assist with community wildfire protection plans to help describe the needs of protecting property in the event of a catastrophic wildfire.

FF15 Public Concern: The managing agencies should correct the analysis of fire regimes and recommendations because it is based on inaccurate information.

We recognize the limitations in the fire severity information, and we recognize the sampling, scale, and fire-scar interpretation biases and uncertainties associated with composite fire intervals and the methodologies used in the Grissino-Mayer et al. (2004), Romme et al. (2009), and McGarigal and Romme (2005) publications (as described in Baker and Ehle 2001 and Kou and Baker 2006), but we believe that our use and interpretation of those SJNF and TRFO-specific publications are valid, although we agree that the fire frequencies on the planning area during the reference period were likely longer than those described in those documents.

### 4.10 Heritage and Cultural Resources

HC1 Public Concern: The managing agencies should revise Desired Condition 16.1 to include a definition of "significant heritage and cultural resources."

Desired conditions regarding heritage and cultural resources have been updated for accuracy and clarification. Please refer to the Heritage and Cultural Resource section of the LRMP.

HC2 Public Concern: The managing agencies should clarify how historic and prehistoric resources would be preserved.

Historic and prehistoric resources would be preserved in accordance with the Secretary of the Interior's Standards for Historic Preservation. The LRMP components outlined in the LRMP provide specifics on how historic and prehistoric resources would be preserved.

- Public Concern: The managing agencies should include the Southern Ute Indian Tribe among the Indian nations with known cultural interests in the planning area.
   Both the LRMP and the FEIS have sections regarding tribal affiliation with the SJNF and TRFO.
   All of the tribes that have cultural affiliation with the SJNF and TRFO, including the Southern Ute Indian Tribe, are listed in tables in these documents.
- HC4 Public Concern: The managing agencies should establish an advisory board to propose the cultural and historic sites on BLM lands for inclusion in the National Register of Historic Places.

Under the 2004 regulations for the National Historic Preservation Act, the federal agencies are required to consult with local interested parties. The SJNF and TRFO are currently working with several local groups regarding heritage and cultural resources. If local interested parties wish to form an advisory group the SJNF and TRFO would be happy to work with them. Nothing in the LRMP precludes interested parties from forming an advisory board. However, establishing a cultural resources advisory board is outside the scope of the LRMP.

HC5 Public Concern: The managing agencies should cooperate with the Southern Ute Indian Tribe regarding tribal forest gathering activities.

In 2005 the SJNF and TRFO initiated consultation with the Southern Ute on the Tribal Forest Protection Act. No response was received, but the SJNF and TRFO would be happy to consult with the Southern Ute on this issue. SJNF and TRFO managers would continue to allow Native Americans to collect botanical and other special forest products from the public lands within the constraint of ecological sustainability. SJNF and TRFO managers would also coordinate and collaborate with Native American governments in order to increase awareness and knowledge of culturally significant plants. SJNF and TRFO managers would continue to consult with tribes and pueblos (and knowledgeable individuals) in order to identify important cultural areas and traditional cultural properties. As part of the National Programmatic Agreement revision process,

the BLM would be contacting consulting tribes, including the Southern Ute to establish a Memorandum of Agreement (MOA) regarding formal consultation processes.

## HC6 Public Concern: The managing agencies should recognize that surface-disturbing activities can lead to beneficial impacts to cultural resources through inventories and discoveries.

Under Cumulative Impacts in the Heritage and Cultural Resources Section of the EIS, we state, "Alternatives that result in more acres of planned and budgeted management activities, such as Alternatives A and D, may reduce adverse cumulative impacts. This is because more inventory and evaluation would be required under these alternatives. The additional inventory and evaluation may lead to more heritage/cultural resources being located, and a potential reduction of adverse cumulative impacts caused by natural processes after heritage/cultural resources are brought under appropriate management. Oil and gas management and fuels management are large contributors to the inventory and evaluation of heritage/cultural resources."

As of December 20, 2011, 73,660 acres had been surveyed for cultural resources on BLM lands within the SJNF and TRFO. A substantial percentage of this was for oil and gas development, but a considerable amount of it was for other non-oil and gas undertakings. Up to this point most of the oil and gas development has been on BLM lands within the SJNF and TRFO; therefore, it is an overstatement to claim that "hundreds of thousands of acres have been surveyed as a result of oil and gas development in the area."

#### Public Concern: The managing agencies should ensure that if discoveries of cultural or historic properties are made, the Historic Preservation Department, Traditional Culture Program, would be contacted and work would be suspended until appropriate mitigation has been developed.

This is standard policy outlined in BLM and USFS cultural and heritage manuals and handbooks including Standard Stipulations for Oil and Gas, the BLM and USFS Cultural Resource Permit Stipulations, regulations for the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act.

- Public Concern: The managing agencies should ensure the oil and gas section is consistent with the Heritage and Cultural Resources section and Appendix H.
   The oil and gas section has been revised to reflect the Heritage and Cultural Resources section and Appendix H.
- HC9 Public Concern: The managing agencies should clarify that before oil and gas activities may proceed, archeological surveys must be completed to comply with Section 106 of the National Historic Preservation Act.

The need to comply with Section 106 is addressed in the FEIS Heritage and Cultural Resources section analyzed under Impacts to Heritage and Cultural Resources from Oil and Gas Management.

HC10 Public Concern: The managing agencies should include historic stock driveways on the Heritage Resource List to preserve historic horse and pack use.

Stock drive ways are evaluated on a case by case basis for eligibility to the National Register of Historic Places. Segments that are determined to be eligible are preserved or mitigated in accordance with the National Historic Preservation Act. Use of these stock driveways for horse packing would in most cases be considered a compatible use of the historic resource.

HC11 Public Concern: The managing agencies should provide greater protection for the Old Spanish Trail and include a map of it in the leasing stipulations.

The geographic information for leasing stipulations includes a layer of the Old Spanish Trail route with a buffer to mitigate potential impacts from oil and gas leasing and development as described in the leasing stipulations (see Appendix H). Because there are more than 70 resource-specific leasing stipulations, it was not practical to provide a map of every resource, such as the Old

Spanish Trail. However, the geodatabase containing this information is available online at the SJNF and TRFO planning website at <a href="http://www.fs.usda.gov/goto/sanjuan/planning">http://www.fs.usda.gov/goto/sanjuan/planning</a> or <a href="http://www.blm.gov/co/st/en/fo/sjplc/land\_use\_planning.html">http://www.blm.gov/co/st/en/fo/sjplc/land\_use\_planning.html</a>. Alternative A is existing conditions and has standard lease stipulations for the Old Spanish Trail. Alternatives B and D utilize an NSO stipulation for 0.5 miles on either side of the Old Spanish Trail. Alternative C considers an NSO stipulation for 5 miles on either side of the trail. In addition to the leasing stipulations for the Old Spanish Trail, there are three objectives and standards in the LRMP for the Old Spanish Trail. Please refer to the Heritage and Cultural Resources section of the LRMP.

#### 4.11 HD Mountains

HD1 & HD2 Public Concern: The managing agencies should designate the HD Mountains as wilderness because of the area's natural and archeological resources to defend them against oil and gas drilling, because the excuse that they are not eligible due to noise is completely unreasonable, and because they provide a healthy wildlife ecosystem and essential habitat for sizable elk and deer herds.

The HD Mountains are not capable/available for wilderness designation due to the current and future drilling activity associated with the gas wells in this region. Opportunities for solitude exist in the core of the area but are hindered because of the visual and audible impact from the current and future gas field production and traffic on the surrounding roads. A proposal to drill 138 new wells in the HD Mountain analysis area (federal, private, and state jurisdiction) was approved for the federal jurisdiction as documented in the Final EIS for the Northern San Juan Basin Coal Bed Methane Project in La Plata and Archuleta Counties (2007). This analysis and decision remains valid and revocation of the lease rights in for the HD Mountains is not within the scope of the decisions to be made in the LRMP revision.

HD3 Public Concern: The managing agencies should correct inconsistencies related to whether the HD Mountains provide solitude.

The contradiction noted regarding the HD Mountains opportunity for solitude has been revised in Appendix C.

HD4 Public Concern: The managing agencies should provide accurate information about how the HD Mountains got their name.

Reference to history of the name was removed as it is not relevant.

HD5 Public Concern: The managing agencies should correctly analyze the large areas of the HD Mountains that are not slotted for oil and gas development.

The term "slotted for oil and gas development" is not clearly defined within the comment. The entirety of the HD Mountains area is within a "high oil and gas potential" area, including CBM. Additionally, 88% (17,388 acres) of the HD Mountains Colorado Roadless Area (CRA) is currently leased for oil and gas development. Although actual development of the leases has not been extensive within the CRA to date, valid existing leases must be considered in the planning effort as their development is the decision of the leaseholder.

HD6 The managing agencies should discuss how resources would be managed in the HD Mountains in relationship to the ROD from the previous Northern San Juan Basin ElS. Absent any conflict with management prescribed in this LRMP, decisions from the 2007 Northern San Juan Basin ROD are incorporated into and carried forward in the new LRMP. Where there is a conflict in prescribed management between the new LRMP and the Northern San Juan Basin ROD, this LRMP takes precedence.

#### 4.12 Insects and Disease

ID1 Public Concern: The managing agencies should provide more robust management strategies to ensure epidemic insect outbreaks are rare.

Please refer to the new Insects and Diseases section in the LRMP that includes five desired conditions that better reflect the SJNF and TRFO's efforts to respond to insect outbreaks.

ID2 Public Concern: The managing agencies should include a fuller discussion of the impact of insect infestation in the planning area to more accurately represent the state of NFS lands, to ensure that the LRMP includes strategies to reduce the risk of insect epidemics and wildfire, and to ensure that the Rocky Mountain Landscape Simulator does not underestimate the scale and intensity of insect and fire events.

The SJNF does not have native lodgepole pine, and our spruce-fir is a much more diverse landscape than the Routt National Forest and is not as prone to bark beetle outbreaks at the scale we have seen in the northern part of the state. That said, we do have high risks in our second growth ponderosa pine, which we have been actively managing to reduce densities, we are also seeing a great deal of bark beetle activity in other conifer species and the discovery of sudden aspen decline. If the vegetative goals we have set are accomplished we would have made great strides in reducing risk from insects, pathogens and fire. The insects and disease section has been re-written to address changing conditions. The bottom line is we feel that we do have a proactive integrated pest strategy, but we did not do a very good job of pointing it out.

#### 4.13 Inventoried Roadless Areas

- IR1 Public Concern: The managing agencies should designate the Bear Creek Roadless Area as MA 1 to manage the Bear Creek watershed for non-motorized use.
  Inventoried roadless areas (IRAs) (now termed CRAs) are to be managed under the 2012 Colorado Roadless Rule, which contains significant restrictions to protect these areas from development.
- IR2 Public Concern: The managing agencies should designate the non-motorized portions of the Baldy Roadless Area as MA 1 because this area should be identified as unsuitable for over-snow motorized recreation.
   Baldy is an IRA on the SJNF and was analyzed for MA 1 prescription, as well as identified as unsuitable for winter motorized uses in Alternative C. This area would be managed under the

2012 Colorado Roadless Rule, which affords protective measures for this area.

- IR3 Public Concern: The managing agencies should correct statements indicating that the Hermosa Creek area was not recommended as wilderness during the RARE II process. The Hermosa Roadless area was found to have a high wilderness attribute rating during the RARE II process. However, the USFS did not recommend 146,105 acres for wilderness due to interest in mineral development and mechanized/motorized recreation in the area. The primitive and roadless nature of the area was protected by other means within the 1983 LRMP and the 1992 amendment.
- IR4 Public Concern: The managing agencies should include more information to explain why all IRAs meeting the available and capable requirements for wilderness designation are not being recommended for inclusion in the National Wilderness Preservation System.
  Appendix C has been revised to more fully articulate agency rationale for findings on each IRA. As a multiple-use agency, the USFS must consider other, competing uses and balance these with the need for additional wilderness designations. Congress has the authority at any time to designate any USFS land area wilderness if the area meets Wilderness Act requirements.
- IR5 Public Concern: The managing agencies should include a desired condition for roadless areas to provide LRMP consistency.
   Management of IRAs is guided by the Colorado Roadless Rule (2012). This LRMP incorporates

Management of IRAs is guided by the Colorado Roadless Rule (2012). This LRMP incorporates that rule by reference.

# IR6 Public Concern: The managing agencies should clarify that roadless areas would be managed in accordance with the new Colorado Roadless Rule to ensure that existing lease rights would be honored.

The Colorado Roadless Rule provides specific guidance to the USFS regarding CRA management. This rule is therefore incorporated by reference in the LRMP.

## IR7 Public Concern: The managing agencies should leave decision space to incorporate the Colorado Roadless Rule.

The Colorado Roadless Rule is incorporated into the LRMP and would guide the management of CRAs.

## IR8 Public Concern: The managing agencies should use the definition of roadless areas that is consistent with existing federal regulations.

The basis for how IRAs are defined is rooted in the 1964 Wilderness Act (Public Law 88-577; 16 USC 1131–1136), which defines wilderness and requires the Secretary of Agriculture to map wilderness and primitive areas. The procedure used by the USFS for wilderness evaluation and inventory is provided in Forest Service Handbook (FSH) 1909.12 - Land Management Planning Handbook, Chapter 70 - Wilderness Evaluation. The history of the SJNF roadless inventory and process by which the current inventory was developed is described in Volume III, Appendix C - Roadless Area Inventory and Wilderness Evaluation.

The intent of this paragraph was not to provide a formal definition of the IRAs, but rather to disclose that the transportation system is managed to avoid new impacts within and to preserve the character of IRAs. The paragraph would be altered to eliminate potential conflict with the current or future definition of IRAs.

## IR9 Public Concern: The managing agencies should ensure that the proposed roadless area adjacent to Durango Mountain Resort not affect the resort's implementation of new facilities.

The IRA adjacent to the permitted Durango Mountain Resort ski area would not affect any approved developments under the current Durango Mountain Resort permit.

## IR10 Public Concern: The managing agencies should update the inventory of roadless areas in the SJNF.

The IRAs discussed in Volume III, Appendix C are the most recent findings for the USFS areas of the SJNF and TRFO. The inventories were conducted per agency policy and direction and were therefore carried forward through the planning process. This process is discussed in the background section of Appendix C.

# IR11 Public Concern: The managing agencies should modify the Preferred Alternative to ensure that the Treasure Mountain roadless area would be managed so that the Continental Divide National Scenic Trail is adequately protected.

IRAs would be protected under the Colorado Roadless Rule, which allows minimal, if any, development within these areas. Additionally, the Continental Divide National Scenic Trail is protected via other features/guidelines in the LRMP, such as visual resources and recreation.

# IR12 Public Concern: The managing agencies should include specific desired conditions, objectives, or program emphasis for potential wilderness or roadless areas because roadless areas are a large component of the SJNF.

The SJNF would manage CRAs consistent with the 2012 Colorado Roadless Rule.

#### IR13 Intentionally left blank.

## IR14 Public Concern: The managing agencies should reference and evaluate the potential impacts of the Colorado Roadless Rule on oil and gas development in the SJNF and TRFO.

The FEIS has been updated to reflect the current situation regarding the recent Colorado Roadless Rule.

### 4.14 Invasive Species

- IV1 Public Concern: The managing agencies should clarify Desired Condition 13.4 to acknowledge that roads and trails may contribute to the spread of non-native species. By stating this desired condition we are implicitly recognizing the role that a transportation system contributes to noxious weed management issues. We acknowledge the difficulty in managing non-native species along roads and trails; however, desired conditions are aspirational and reflect long-term goals. In addition, invasive species management within the transportation system—be it roads or trails—would be addressed in invasive action plans as roads and trails are natural spread vectors.
- IV2 Public Concern: The managing agencies should clarify how they would control the spread of non-native plants in wilderness areas.
   This comment refers to a desired condition. Desired conditions are aspirations and reflect long-term goals. Non-native plant management within wilderness areas would be addressed either in
- term goals. Non-native plant management within wilderness areas would be addressed either in the SJNF and TRFO invasive species action plan or project-level mitigation measures or both.

Public Concern: The managing agencies should include washing equipment as an

- objective for invasive species.
  Agency weed prevention practices are disclosed in the referenced SJNF and TRFO invasive species action plan. Prevention practices are also referenced under the objectives and standards in the Invasive Species section in the LRMP.
- IV4 Public Concern: The managing agencies should clarify whether Objectives J.2 and J.3 exclude cheatgrass.
  Cheatgrass treatment is project specific due to the widespread occurrence of this weed across the SJNF and TRFO landscape. Cheatgrass treatment would be a priority where it presently is not common or can be controlled through management. Therefore the 25% goal could include cheatgrass control.
- IV5 Public Concern: The managing agencies should include invasive aquatic species in the discussion of invasive species because several species are serious threats to aquatic systems.

Aquatic invaders are specifically addressed in the SJNF and TRFO invasive species action plan, as discussed in the Invasive Species Program Emphasis section of the LRMP.

IV6 Public Concern: The managing agencies should add invasive plant species (including tamarisk) to the list of management indicator species (MIS) to track populations and encourage efforts toward their elimination.

Consideration of plant species as MIS were evaluated, but the SJNF decided that direct project-level monitoring was the most site-specific and efficient monitoring method for invasive plant species.

IV7 Public Concern: The managing agencies should include cheatgrass and Kentucky bluegrass on the list of invasive plant species because these species allow for more erosion in riparian areas.

Cheatgrass, which occurs on upland sites, is identified as an invasive species in the FEIS and there is an objective in the Invasive Species section of the LRMP that calls for increasing the annual acres of noxious weeds treated, which includes treating cheatgrass.

Kentucky bluegrass, which occurs in terrestrial and riparian/wetland ecosystems on the SJNF and TRFO, does not meet our definition of invasive species because it does not cause economic or environmental harm or harm to human health. Although Kentucky bluegrass is not the desired

IV3

grass species we want in the mountain grasslands and riparian areas on the SJNF and TRFO, it does provide valuable forage for livestock and wildlife and serves as ground cover to protect soils from erosion.

IV8 Public Concern: The managing agencies should include an evaluation of the possible transfer of unwanted nuisance aquatic species from water used during oil and gas development.

Nuisance aquatic species would be addressed through subsequent project-level decisions, most likely through a Notice to Lessees.

### 4.15 Lands and Special Uses

LD1 Public Concern: The managing agencies should expand the discussion of energy corridors and linear energy transmission authorizations to include locals need for power line rights-of-way.

The discussion concerning designated energy corridors is limited to major facilities, not local distribution systems. Where there is no legal prohibition to authorize local electrical system rights-of-way, such proposals would be assessed based on their proposed design and location. Such systems are not restricted to designated energy corridors under the proposed LRMP.

LD2 Public Concern: The managing agencies should allow electrical energy rights-of-way in all MAs where they are not precluded by law.

Exclusion areas for rights-of-way, communications sites, and other land use authorizations have been specifically listed in the LRMP as guidelines under the Lands and Special Uses section to clearly identify the areas that are not available for electrical energy rights-of-way. On the SJNF, all areas within MA 1 are exclusion areas, as well as wilderness area, recommended wilderness areas, the Piedra Area, recommended suitable Wild and Scenic Rivers (WSRs) (wild segments only), and research natural areas (RNAs). On the TRFO, exclusion areas coincide with WSAs and recommended suitable WSRs (wild segments only).

LD3 Public Concern: The managing agencies should expand the Draft LRMP's program emphasis and strategy to list and classify the types of lands that would be pursued for acquisition.

The Draft LRMP included specific criteria in Part 3 - Design Criteria under the Lands Program section that would be used to prioritize acquisition of lands. These criteria have been updated and are found under Guidelines in the Lands and Special Uses section of the LRMP.

- LD4 Public Concern: The managing agencies should increase the corridor width for the proposed Tri-State gas and electric transmission line and correct the Nucla-Cahone transmission line voltage and Tri-State's corporate name.
  - This LRMP has adopted the width in the West-wide Energy Corridor ROD. We have made corrections to the Nucla-Cahone transmission line voltage and to Tri-State's corporate name.
- LD5 Public Concern: The managing agencies should clarify whether the public would have access to public land via road access provided to Wolf Creek Village.

The status and use of the proposed access road to Wolf Creek Village is not within the jurisdiction of the SJNF. This is under the authority of the Rio Grande National Forest.

- LD6 Public Concern: The managing agencies should transfer certain BLM public lands adjoining Mesa Verde National Park to the management of Mesa Verde National Park. Jurisdictional transfer of lands between federal agencies requires Congressional action and is beyond the scope of the LRMP.
- LD7 Public Concern: The managing agencies should ensure the LRMP allows for future needed utility corridors and communication and transportation infrastructure.

Access to existing and future transportation, utility, and communication infrastructure is addressed in the Lands and Special Uses section of the LRMP and in each of the allowable use tables associated with specific areas discussed in Chapter 3 of the LRMP.

- LD8 Public Concern: The managing agencies should clarify the boundaries of MAs to ensure they do not conflict with existing Colorado Department of Transportation rights-of-way. Existing rights associated with current rights-of-way would not be impacted by the designation of MAs in the LRMP.
- LD9 Public Concern: The managing agencies should ensure that the Colorado Department of Transportation low-elevation flights would be allowed so that activities designed to increase safety are not restricted.

The LRMP does not propose any direction that would restrict low-elevation flights, nor does it approve such actions.

- LD10 Public Concern: The managing agencies should ensure that the road connection between Grandview and Ewing Mesa would not be precluded by the designation of the Grandview Ridge area because this connection would reduce traffic on U.S. Highways 160 and 550. The LRMP does not propose any direction or make any designations that would preclude construction of the connection between Grandview and Ewing Mesa. Such a proposal would require future analysis at a site-specific level.
- LD11 Public Concern: The managing agencies should ensure that management designations would not restrict the Colorado Department of Transportation from avalanche mitigation activities.

The LRMP does not propose any direction of designations that would preclude the Colorado Department of Transportation from conducting avalanche mitigation activities, nor does it specifically approve such activities.

LD12 Public Concern: The managing agencies should clarify how and where NFS lands would be disposed of.

Lands are identified for disposal based on management, administrative, and resource needs of the respective agency. The specifics of an individual land exchange, acquisition, or disposal are based on the circumstances of the respective purpose and need for each proposal. Each exchange, acquisition, or disposal would require a site-specific decision process (NEPA) and is not within the scope of the FEIS.

LD13 Public Concern: The managing agencies should lease or rent recreational access and use in the Dolores River corridor from private landowners.

The government can enter into lease or rental contracts with private landowners if there is a public benefit. This type of action is outside the scope of the FEIS and is better addressed through a separate decision process.

- LD14 Public Concern: The managing agencies should modify the desired conditions statement related to the Dolores, Columbine, and Pagosa areas to include existing rights-of-way.
  General discussion of energy corridors and linear energy transmission authorizations (rights-of-way) is provided in the Lands and Special Uses section of the LRMP.
- LD15 Public Concern: The managing agencies should manage transmission line corridors consistently with adjacent public lands.

Where possible, decisions are compatible with adjoining jurisdictions but differences do exist across the landscape that may warrant treating alignment of corridors separately. The West Wide Energy Corridor of 2007 has been recognized in the LRMP to facilitate routing of electric transmission lines and energy pipelines throughout the 11 western states. Nothing in the LRMP precludes a utility from applying for a right-of-way except in designated exclusion areas.

#### LD16 Intentionally left blank.

LD17 Public Concern: The managing agencies should use the most current Tri-State facility priority list to analyze environmental consequences.

The SJNF and TRFO have received expressions of interest in the form of out-year plans and priority lists from several land-use constituents such as Tri-State Energy; however, analysis of these projects would be speculative and they are not considered reasonably foreseeable projects prior to receiving initial applications.

#### 4.16 Livestock and Rangeland Management

LR1 Public Concern: The Managing agencies should delete Desired Condition 6.16 because we question the feasibility that "All rangelands on SJNF and TRFO display satisfactory rangeland conditions."

This desired condition has been deleted.

- LR2 Public Concern: The managing agencies should revise the objective related to rangeland management because the time frame is unrealistic and because it is not specific enough.

  Objectives regarding livestock and rangeland management have been revised. Please see Livestock and Rangeland Management in the LRMP.
- LR3 Public Concern: The managing agencies should revise Objective Q.3 to account for invasive species control issues to ensure the time frame is realistic.
   Objectives regarding livestock and rangeland management have been revised. Please see Livestock and Rangeland Management in the LRMP.
- LR4 Public Concern: The managing agencies should make Measure XVIII.A.4 a standard to ensure grazing systems provide for rest to promote plant health.
   Rangeland conditions vary across the SJNF and TRFO. Many areas are moving towards desired conditions. Therefore, the unilateral application of this guideline is not needed. The USFS and BLM can adequately manage resources with this as a guideline.
- LR5 Public Concern: The managing agencies should change the standard for grazing to measure the amount of plant material remaining.
   Standards and guidelines for rangeland vegetation have been revised. Allowable forage use is a guideline and the measurement of residual plant material can be an appropriate monitoring technique. Please refer to the Livestock and Rangeland Management section of the LRMP.
- LR6 Public Concern: The managing agencies should make Measure XVIII.A.9 a standard because livestock should not be allowed in non-functioning riparian areas and because livestock trailing should not be allowed in riparian areas.

There are many reasons other than livestock grazing that result in riparian areas being rated as non-functional or functioning-at-risk. There are additional management tools other than complete exclusion of livestock to improve riparian conditions. Therefore, the unilateral application of this guideline is not needed. The managing agencies can adequately manage resources with this as a guideline.

LR7 Public Concern: The managing agencies should avoid closing allotments to grazing if the area can be brought into compliance.

This direction is only a guideline and addresses rangeland productivity and conflicts with other resources that would make livestock grazing unfeasible. On forage-producing lands, reallocation of animal unit months (AUMs) would take place in accordance with regulation and policy.

LR8 Public Concern: The managing agencies should reconsider their evaluation of the sheep industry to consider current trends towards greater lamb and wool consumption.

The managing agencies did address sheep and wool trends in the Livestock and Rangeland Management section in the FEIS. The intent was to identify general trends and not to provide an analysis of the economics of the sheep industry. Please see Demand for Wool and Sheep in the Affected Environment.

## LR9 Public Concern: The managing agencies should consider current and historic bighorn sheep populations in determining domestic sheep grazing suitability.

The LRMP and FEIS identify suitability at the landscape scale. Management changes needed to maintain or improve big horn sheep viability are made at the project level using adaptive management processes. Suitable domestic sheep acres have decreased between the Draft EIS and FEIS due to management decisions at the project level.

## LR10 Public Concern: The managing agencies should close vacant domestic sheep allotments in the alpine areas to livestock use to protect bighorn sheep.

The managing agencies coordinate bighorn sheep management with the CPW using the statewide CPW Bighorn Sheep Management Plan and incorporate individual Data Analysis Unit bighorn sheep management objectives. Domestic sheep management, using adaptive management options designed to avoid contact with bighorn sheep, is implemented at the project/allotment level. Allotment closure or other changes needed to mitigate adverse impacts to bighorn sheep are also addressed at the project/allotment level.

## LR11 Public Concern: The managing agencies should acknowledge the impact of high elk populations on native bunchgrass communities, such as Arizona fescue.

The BLM and USFS cooperate with CPW to provide for wildlife habitat conditions capable of meeting state population objectives, and through this process the agencies do consider ongoing land uses such as livestock grazing and utilization by wildlife. Historically, Arizona fescue was a dominant forage species within the pine type, into the mountain meadow types and up to the dry mixed conifer type. It is a very palatable and desired forage species that is adversely impacted by poor rangeland management practices such as a season-long or continuous livestock grazing practices. Most of the adverse impacts, in the form of longer grazing seasons, less available livestock water, poor livestock distribution, and little knowledge of the effects of livestock grazing time and timing on vegetation, occurred prior to the advent of improved, cooperative livestock management practices we employ today. Much of the Arizona fescue that remains today is probably not preferred by livestock; this is due to the fact that what remains is older, over-mature plants that are less palatable to livestock. However, Arizona fescue plants from seedlings to adult plants are highly preferred in our observations and experience.

# LR12 Public Concern: The managing agencies should include the impacts from big game wildlife in the analysis of grazing because elk and deer represent a significant portion of the grazing in the LRMP planning area.

Where big game forage use and other issues are a concern to resources such as riparian areas, grazing allotment-level, or even landscape-level monitoring plans should be designed to identify their scope and impact. Where monitoring establishes a need to mitigate unacceptable resource impacts caused by big game, the managing agencies would work with CPW to resolve these issues.

## LR13 Public Concern: The managing agencies should revise the Draft EIS to reflect that rangeland would be managed for both big game and livestock.

The statement only addressed ongoing and possibly future trends and was primarily related to the effects to both big game and livestock forage availability due to increased private land development. Regardless of big game numbers continued conversion of agricultural lands to other uses would reduce available forage for both livestock and big game resulting in increased forage demand that would need to be remedied elsewhere. In addition, while big game numbers appear to be stabilized at present—especially elk—elk numbers dramatically increased in the 1980s when the original LRMP was developed and then subsequently stabilized in the 2000s.

## LR14 Public Concern: The managing agencies should include elk among the users of the land to account for the impacts of elk grazing.

Where big game forage use issues are a concern to livestock management, allotment-level monitoring plans should be designed to incorporate big game forage use monitoring. Where monitoring establishes a need to mitigate big game/livestock forage conflicts, the managing agencies would work with CPW to resolve these issues.

### LR15 Public Concern: The managing agencies should ensure that stocking rates are presented consistently and accurately in the documents.

The managing agencies have corrected text and table errors in the FEIS. The comparative stocking rate maps compare different levels of stocking by alternative using ranges. For example, the East Pines Common Allotment is stocked moderately (i.e., a range of 7–15 acres/AUM), which is within the actual 9.4-acre/AUM stocking range.

#### LR16 Public Concern: The managing agencies should make destocking decisions on a sitespecific basis to recognize permittee investments.

On public lands managed by the BLM, decisions to close allotments are an appropriate planning level decision per the BLM planning regulations.

# LR17 Public Concern: The managing agencies should set the allowed AUMs high enough to allow some flexibility to preserve the viability of livestock production and land conservation efforts.

The BLM is required to determine allowable livestock AUMs in the LRMP decision. BLM grazing regulations provide flexibility to adjust permitted AUMs based on existing and subsequent changes in rangeland conditions. Changes are based on project-level decisions. Project-level changes that result in changes to permitted use shown in the LRMP are documented through a plan amendment. Comments provided address adaptive management options available at the project level.

### LR18 Public Concern: The managing agencies should reduce the AUMs in the San Miguel ACEC to protect Gunnison sage-grouse.

Mitigation of perceived adverse livestock grazing impacts to sage-grouse within this ACEC would be addressed through managing season of use and stocking rate adjustments as needed through allotment-level monitoring. Any decisions in livestock grazing at this time would be addressed at the project/allotment level.

## LR19 Public Concern: The managing agencies should justify the departure from the Society of Range Management conversion factors because it is a significant change.

The USFS and BLM use agency regulatory and handbook direction to determine forage demand by an AUM. Please refer to the USFS Rocky Mountain Region Rangeland Analysis and Management Training Guide (1996) and BLM grazing regulations at 43 CFR 4100 for additional guidance.

# LR20 Public Concern: The managing agencies should provide a more balanced description of grazing activities to include the positive aspects of grazing and to recognize the economic and social contributions ranching families make to the region.

The introduction in the FEIS has been revised to acknowledge the integral role ranching families play in the planning area.

# LR21 Public Concern: The managing agencies should monitor and assess sage grouse habitat within active range allotments to determine what grazing practices should be instituted within the allotments to ensure adequate habitat is protected for sage-grouse.

Big game forage and browse use is monitored at the landscape level as opposed to the grazing allotment level in Data Analysis Units developed by CPW. This information is provided to the USFS and BLM and used during allotment-level grazing management planning in addition to other information gathered by our grazing permittees, wildlife biologists, other agency specialists,

and rangeland managers. Any information used or gathered for planned decisions affecting grazing allotments is public information. We agree that managed livestock grazing can be compatible with protection of sage-grouse habitat. The FEIS states that the greatest impacts to livestock would be on those allotments where pasture rotations are not employed, i.e., managed livestock grazing. In most cases, rotation grazing systems are being employed on public land grazing allotments.

- LR22 Public Concern: The managing agencies should clarify whether cattle spend a "disproportionate amount of time" in the Arizona fescue mountain grassland type. Cattle spend a disproportionate amount of time in grasslands (including the Arizona fescue mountain grassland type that occurs on SJNF and TRFO) since cattle prefer to graze grasses (Holechek et al. 1982, 1998) and grasslands often contain an abundance of grasses that are desirable to cattle, compared to shrublands or forests that contain less grasses or grass species that are less desirable to cattle (Clary and Leininger 2000).
- LR23 Public Concern: The managing agencies should work closely with ranchers and grazing permittees and raise the value for grazing permittees to better manage NFS lands. The managing agencies acknowledge the ranching industry's contributions to maintaining open space and continuing partnerships to manage public land resources in multiple sections of the FEIS and LRMP. Please see Livestock Grazing and Rangeland Management LRMP Desired Conditions and Affected Environment in the FEIS. Additionally, open space and partnerships are acknowledged in the discussion of People and Communities and Partnerships sections in the LRMP.
- LR24 Public Concern: The managing agencies should close vacant allotments located in wilderness areas because livestock practices can conflict with wildlife goals.
  Livestock grazing in wilderness areas is managed using guidance from the Congressional Wilderness Grazing Guidelines and the Wilderness Act. Specific actions, such as closure of vacant allotments, are analyzed at the project level.
- LR25 Public Concern: The managing agencies should provide a broader analysis of market trends to include demand for grass-fed beef.

  This trend is discussed and revised in the FEIS.
- LR26 Public Concern: The managing agencies should provide data to support the conclusion that there is a direct correlation between livestock numbers and impacts on soils, water, and riparian areas.

Conclusions drawn relating to livestock and implied adverse impacts to soils, water, and riparian areas are directly correlated to unmanaged or poorly managed livestock. Livestock management plans developed to improve or maintain riparian, soil, and water conditions should result in no adverse effects due to livestock grazing.

LR27 Public Concern: The managing agencies should protect archeological and cultural resources from the impacts of livestock grazing.

Potential adverse livestock grazing impacts to cultural resources are mitigated through decisions at the project/allotment level. Appropriate mitigation measures are incorporated into livestock grazing systems via the grazing permit and allotment management plan.

LR28 Public Concern: The managing agencies should work with tribes to provide fencing. to protect tribal lands from livestock impacts.

This specific issue cannot be addressed in the LRMP/FEIS, as it is beyond the scope of this analysis. However, the managing agencies agree that future intergovernmental discussions should take place as needed.

LR29 Public Concern: The managing agencies should recognize that livestock grazing is not incompatible with improving rangeland health.

Livestock management designed to take advantage of available forage and improve rangeland health depends on the effective partnership between the grazing permittee and the managing agency. Forage use and rangeland health are not mutually incompatible goals. Successful grazing management plans developed through agency grazing decisions are a result of not only public participation through the NEPA process, but more critically, through communication and coordination with affected grazing permittees.

LR30 Public Concern: The managing agencies should remove the restrictions on trailing livestock because trailing routes are often the only practicable way to move livestock in and out of an area.

The comment refers to a guideline in the LRMP that recommends livestock trailing along the entire length of a riparian area should be prohibited. As a guideline this direction is appropriate and should remain part of the LRMP. Where there are no other ways to avoid trailing livestock within riparian areas, appropriate mitigation measures would be developed to facilitate livestock trailing and to maintain riparian area health.

LR31 Public Concern: The managing agencies should work with the ranching community to address drought-related issues.

The managing agencies discussion regarding the ongoing drought is only a discussion of recent trends. Any changes to livestock grazing management due to long-term vegetation changes due to drought would be addressed at the project/allotment level and would be implemented in consultation and cooperation with affected livestock producers.

LR32 Public Concern: The managing agencies should acknowledge the sense of ownership and stewardship that grazing permittees have for the land.

The managing agencies acknowledge the ranching industry's contributions to maintaining open space and continuing partnerships to manage public land resources in multiple sections of the FEIS and LRMP. Please see Livestock Grazing and Rangeland Management in the FEIS. Additionally, open space and partnerships are acknowledged in the discussion of People and Communities and Partnerships sections in the LRMP.

LR33 Public Concern: The managing agencies should clarify whether the grazing model (the livestock grazing suitability analysis) includes protection of riparian areas from grazing damage.

The livestock grazing suitability analysis identifies some riparian areas on the SJNF and TRFO as not suitable for livestock grazing, so those areas would be protected from the effects of livestock grazing. The livestock grazing suitability analysis identifies some other riparian areas in the planning area as suitable for livestock grazing, so those areas would not be protected from the effects of livestock grazing. Suitable riparian areas would be protected from the potential adverse effects of livestock grazing, however, through implementation of LRMP components.

LR34 Public Concern: The managing agencies should include a more robust discussion of the impacts to livestock grazing from oil and gas development.

The FEIS includes a discussion of impacts to livestock grazing in the alternative comparison section of the Livestock and Rangeland Management section.

#### 4.17 Lands with Wilderness Characteristics

LW1 Public Concern: The managing agencies should ensure that wilderness characteristics of BLM lands are preserved.

Appendix O describes the wilderness inventory process for BLM lands, which includes a positive finding of wilderness characteristics for the Snaggletooth area. Existing oil and gas leases must be honored, but can be controlled with surface use stipulations. The Snaggletooth area, from Bradfield Bridge to Mt. Sheep Point, is identified in the LRMP as an area to be managed for its wilderness characteristics. Measures to accomplish this are described in the LRMP. Existing WSAs would continue to be managed under the BLM's Interim Management Policy for WSAs

(BLM Manual 6330), which strictly disallows any activities that would permanently impair the area's wilderness values.

LW2 Public Concern: The managing agencies should continue to manage WSAs and other lands with wilderness characteristics to maintain those characteristics because the BLM and other agencies are obligated to inventory for, and consider a range of alternatives to protect, lands with wilderness characteristics.

WSAs continued to be managed so as not to impair the ability of Congress to make a wilderness designation per BLM Manual 6330. An inventory of BLM lands for wilderness character has been conducted and the results of this inventory are found in Appendix O and are incorporated into the FEIS and LRMP. Management strategies for the seven identified areas of lands with wilderness characteristics are evaluated within Alternatives B and C.

LW3 Public Concern: The managing agencies should ensure that decisions resulting from the LRMP/EIS are in accord with the FLPMA because designating BLM lands as wilderness exceeds the authority of the BLM under FLPMA.

Wilderness characteristics are inventoried under Section 201 of FLPMA. Findings of the inventories are not used as the sole determination of land use decisions. Wilderness characteristics are to be evaluated among other resource values and potential uses during the NEPA process. The LRMP does not designate or propose any BLM wilderness area. The authority to designate wilderness is reserved by Congress under the Wilderness Act.

### 4.18 Management Area Descriptions and Suitability Tables

MA1 Public Concern: The managing agencies should explain how management areas located along the border with the Grand Mesa, Uncompanyere, and Gunnison National Forests are compatible across the forest boundaries.

The criteria used to allocate management areas throughout the SJNF are discussed in the LRMP and are further detailed in the project administrative record. One of the criteria used was compatibility with management of adjoining units and every effort was made to be consistent where appropriate. However, not all management areas identified in the LRMP are consistent with the management of adjoining units, due to different historical emphases in management, difference in current and projected uses, and for other reasons.

- MA2 Public Concern: The managing agencies should reconsider the location of MA 5 areas along the Dolores River because they are inappropriately placed between MAs 2 and 3. MAs with very different emphases can be placed adjacent to each other depending on the management emphasis for a particular area. There are many instances throughout the SJNF and TRFO where landscapes with a history of heavy resource development are located adjacent to areas that are undeveloped and in a more pristine natural condition. In some cases the MAs capture this multiple-use history and provide for future uses that preserve these particular characteristics of the landscape. Note that MAs no longer apply to TRFO lands.
- MA3 Public Concern: The managing agencies should designate all lands previously leased for oil and gas development as MA 5 because only Congress has the right to prohibit development once a lease has been issued.

Previously leased lands would be managed according to the terms, conditions, and stipulations associated with the individual lease. Areas that have been available for lease but have not been leased have been considered, where appropriate, for a change in availability, restrictions, or stipulations.

MA4 Public Concern: The managing agencies should address the Wolf Creek proposal to designate the ski area as MA 8 outside of the LRMP revision process because the ski area must demonstrate that the proposal would be consistent with existing laws, policy, and the LRMP.

A proposal from a ski area for consideration of expansion is outside the scope of the FEIS. Various MA scenarios have been considered through the range of alternatives with regard to future potential ski area expansion.

- MA5 Public Concern: The managing agencies should designate the HD Mountains as a MA 2 to protect the unique archaeology, seeps, and springs of those mountains.

  The HD Mountains are proposed to be designated under MA 2.
- MA6 Public Concern: The managing agencies should reclassify the Paradox Basin because lands already leased for oil and gas development should be managed as MA 5.

  MAs no longer apply to BLM lands.
- MA7 Public Concern: The managing agencies should designate all lands on which Kinder Morgan holds oil and gas leases as MA 5 because development of those leases may conflict with the desired conditions of MA 3.

Any current lease can be exercised fully according to the terms, conditions, and stipulations associated with the particular lease until the lease expires. Note that MAs no longer apply to BLM lands.

### 4.19 Minerals and Energy

MN1 Public Concern: The managing agencies should clearly define the criteria for granting exceptions, modifications, or waivers to special stipulations.

Waivers, exceptions, and modifications have been identified for all leasing stipulations (see Appendix H). Although it is difficult, if not impossible, to describe each and every scenario under which a waiver, exception, or modification might be allowed, regulations do allow for the lessee to request waivers, exceptions, or modifications with sufficient justification. For leases on TRFO lands, waivers, exceptions, and modifications would be considered generally and granted or denied based on agency discretion; for SJNF lands, waivers, exceptions and modifications would be granted based on the criteria identified with each stipulation. In some cases a plan amendment may be required in order to grant the request.

MN2 Public Concern: The managing agencies should clarify whether the 4,000-acre estimated affected area is accurate for water reservoir impacts.

The referenced table in the Draft EIS (3.15.40) did contain an error in the description of the stipulation; however, the 4,000-acre approximation was accurate. This statistic is now found in Appendix F.

MN3 Public Concern: The managing agencies should revise the discussion of the Fruitland Formation aguifer.

The LRMP has been revised to be consistent with direction from the Northern San Juan Basin EIS for the Fruitland Formation aquifer. In the Draft EIS, the area was identified as not available for leasing; it is now identified as available with a Controlled Surface Use (CSU) stipulation.

MN4 Public Concern: The managing agencies should include analysis of the effects of development on existing leases.

In the FEIS, the effects of development of existing leases are addressed in the cumulative effects analysis for each affected resource. In those sections, existing and future lease development is analyzed in relationship with other potentially impacting activities to provide an overall assessment of the effects of past, present, and reasonably anticipated activities on the environment.

MN5 Public Concern: The managing agencies should correct references to the Gold Book to reflect the newer 2007 version.

The LRMP and FEIS have been updated accordingly to reflect the 2007 edition.

## MN6 Public Concern: The managing agencies should clarify whether Visual Resources Design Criteria L.1 would apply to desert conditions.

This is a guideline to be followed as applicable. In this particular case, where facilities would exceed a desired height limit and there are no practical alternatives, exceptions to this guideline would be granted.

## MN7 Public Concern: The managing agencies should include standards for energy minerals. The lease stipulations (LRMP, Appendix H) and standards and guidelines for other resources

(e.g., riparian areas, wildlife, air quality) all apply to energy mineral development but are not repeated in the minerals sections.

## MN8 Public Concern: The managing agencies should provide further analysis of the impacts of solid mineral development.

The LRMP contains updated solid minerals descriptions and analysis.

## MN9 Public Concern: The managing agencies should revise the discussion of fluid minerals to include the future, expected CO<sub>2</sub> wells Kinder Morgan expects to drill.

The projected wells were not directly included in the original RFD or in the Supplement to the Draft EIS. For the purposes of the RFD and the questioned Kinder Morgan wells, the six to 15  $CO_2$  wells represent a small percentage of the total RFD projections.

## MN10 Public Concern: The managing agencies should develop standards and guidelines for oil and gas development in sensitive wildlife habitat.

Impacts to wildlife habitat are addressed during the leasing and subsequent Application for Permit to Drill (APD) process. Many concerns related to impacts from oil and gas development on wildlife habitat are addressed in standards and guidelines in the Terrestrial Wildlife section of the LRMP and in stipulations.

## MN11 Public Concern: The managing agencies should provide an accurate and consistent acreage total for oil and gas development opportunities.

Acreages for total oil and gas development opportunities have been revised. Please refer to the FEIS and RFD.

## MN12 Public Concern: The managing agencies should clarify how the number of acres of disturbance from oil and gas was determined.

Acreages of disturbance from oil and gas have been revised and full explanation is given regarding how these numbers were determined. Please refer to the FEIS.

## MN13 Public Concern: The managing agencies should make sure that well count numbers are accurate and consistent.

Well count numbers have been revised for accuracy and clarification. Please refer to the FEIS and RFD.

## MN14 Public Concern: The managing agencies should correct or explain the different amounts of total produced gas cited in the Draft EIS.

Amounts of total produced gas have been revised. Please refer to the FEIS.

## MN15 Public Concern: The managing agencies should correct the description of directional or horizontal drilling.

The section has been rewritten to incorporate discussion of potential for additional surface disturbance and the need to utilize proven technologies as they apply to complex geologic formations.

## MN16 Public Concern: The managing agencies should distinguish oil and gas development impacts by basin.

The FEIS distinguishes the differences in drilling and completion, and in produced water by basin and target zone(s) by basin.

## MN17 & MN18 Public Concern: The managing agencies should consider the impacts of more restrictions on oil and gas development to comply with the Energy Policy Act of 2005.

The LRMP does not propose restrictions that are inconsistent with the Energy Policy Act. Areas that are prospective for oil and gas development are either already leased or available for lease. These areas include the Paradox Basin conventional oil and gas plays (currently approximately 80% leased, the northern San Juan Basin (currently leased and fully developed) and the Paradox Basin Gothic Shale. Prospective leases on land overlying the GSGP that are not already leased have a range of stipulations that would be required to protect physical and biological resources. Where timing limitations and CSU are stipulations are prescribed, the impacts to development should be minor. Where NSO is prescribed, off-site drilling locations would be available and exceptions could be granted if the impacts of surface occupancy are concluded to be acceptable.

## MN19 Public Concern: The managing agencies should include mitigation measures for oil and gas development.

The FEIS has expanded analyses of the effects of oil and gas development on physical, biological, and social resources. Mitigation is in the form of lease stipulations (Appendix H), management standards and guidelines, and application of BMPs. The evaluation of environmental consequences is based on the assumption that these mitigation measures would be applied.

# MN20 Public Concern: The managing agencies should include a 5-acre setback from any water source for oil and gas activity within the Herd Management Area and McKenna Peak wilderness Area to preserve water access for the wild horse herd.

There are stipulations and standards and guidelines in the LRMP that address water quality and wildlife concerns.

## MN21 Public Concern: The managing agencies should revisit the surface facility density provisions for the construction of well pads.

The agencies would revisit surface disturbance provisions at the second and third decision stages of oil and gas decision-making. This FEIS is the first stage (i.e., identification of lands available for lease and stipulations for those lands). At this first stage the exact timing and location of project-specific actions is unknown and thus the analysis of impacts is based on projected development assumptions (see Appendix F). During stage two (exploratory well approval) and stage three (APD), additional environmental analysis would be done using more detailed information (for example, using exact road and well location information). Stage three (when a lessee provides their detailed plans for development) is when the agencies can best evaluate impacts and set provisions for ground disturbance.

## MN22 Public Concern: The managing agencies should acknowledge that they cannot impose stipulations or conditions of approval on valid existing oil and gas leases.

Development of existing leases is subject to valid existing rights, and the potential oil and gas development of existing leases would be consistent with LRMP direction and the terms and conditions of the lease. Activities related to future development on lands currently held under lease are generally subject to the terms and conditions under which they were originally leased. However, the managing agencies do have discretion to modify surface operations or add specific mitigation measures to the lease terms at the project level, when supported by scientific analysis and when necessary to comply with LRMP direction (Yates Petroleum Corp., IBLA 2006-213, 2006-226 and William P. Maycock, IBLA 2008-197, 2008-200).

## MN23 Public Concern: The managing agencies should consider a phased approach to oil and gas leasing and development in the alternatives.

The TRFO and SJNF both considered a phased leasing approach to fluid mineral leasing. The BLM's analysis of the feasibility of a phased leasing approach revealed that a majority of TRFO

lands with medium to high potential for oil and gas production are already leased, leaving limited flexibility to guide future leasing patterns. Past leasing and development activity demonstrates that a natural progression would typically occur around areas that are already developed; e.g., areas with an existing infrastructure would be initially developed and outlying areas would be developed at the pace that existing infrastructure is expanded. Therefore, leasable mineral development should continue to be focused within current production areas first.

In contrast, on SJNF lands a majority of medium to high potential production areas have not been leased. Through its analysis, the SJNF determined that it would be appropriate to manage SJNF lands for orderly development of oil and gas resources in order to better address the resource tradeoffs that occur with oil and gas production on public lands. However, this type of approach does not need to be incorporated as part of the leasing decision; rather, it is best applied to the subsequent, discretionary implementation steps of offering available lands for lease and permitting drilling operations because the agency can consider new information as it becomes available through ongoing development and monitoring of resources. A proposed strategy for orderly leasing and development, outlining the SJNF's approach to "phased leasing and development," is included in the Minerals and Energy section of the LRMP. The strategy is designed to be flexible to accommodate unforeseen issues that may arise and applies only to SJNF lands. The intent of the strategy is to guide the pace and place of development by focusing leasing in areas within or adjacent to existing oil and gas development, and to allow the surfacemanaging agency to temporally guide the location of leasing activity to minimize impacts and conflicts with other multiple uses while still allowing efficient extraction of oil and gas resources. Because the strategy is not part of the oil and gas leasing availability decision, but rather a structured approach to leasing lands that are identified as available for lease, it has not been analyzed as part of any alternative in the LRMP.

## MN24 Public Concern: The managing agencies should acknowledge that the LRMP would apply to existing oil and gas leases.

Development of existing leases is subject to valid existing rights, and the potential oil and gas development of existing leases would be consistent with LRMP direction and the terms and conditions of the lease. Activities related to future development on lands currently held under lease are generally subject to the terms and conditions under which they were originally leased. However, the managing agencies do have discretion to modify surface operations or add specific mitigation measures to the lease terms at the project level, when supported by scientific analysis and when necessary to comply with LRMP direction (Yates Petroleum Corp., IBLA 2006-213, 2006-226 and William P. Maycock, IBLA 2008-197, 2008-200).

## MN25 Public Concern: The managing agencies should provide more detail about the oil and gas stipulations to ensure they comply with existing federal law.

Additional details regarding oil and gas stipulations have been added in Appendix H. All stipulations comply with federal law.

## MN26 Public Concern: The managing agencies should ensure the maps are consistent with the discussion of oil and gas leasing stipulations.

We have corrected the stipulation mapping errors in the LRMP and FEIS.

## MN27 Public Concern: The managing agencies should clarify whether additional NEPA analysis would be needed prior to issuance of oil and gas leases.

The LRMP and EIS provide the NEPA analysis by which land tracts on the SJNF and TRFO would be made available for lease. Additional NEPA analysis would be required prior to the issuance of new oil and gas leases. An additional NEPA analysis would be required prior to the surface disturbance relating to the development on that lease.

## MN28 Public Concern: The managing agencies should add objectives for fluid mineral management.

The fluid mineral desired conditions and objectives provide a vision and emphasis for minerals management, and development of fluid minerals is also subject all LRMP components in every section of LRMP Chapters 2 and 3, as applicable. The program is carried out in an orderly fashion through the leasing program (lands made available for lease, stipulations applied to leases and the nomination and lease sales process), through gas field planning and development, and through monitoring and enforcement programs.

MN29 Public Concern: The managing agencies should include perpetual conservation easements in the list of surface conditions eligible for NSO stipulations.

Federal laws and regulations provide for the development of federal minerals. In areas warranted by physical and biological concerns, additional stipulations could be included to protect those critical resources. Standards and guidelines and stipulations could apply to those lands.

MN30 Public Concern: The managing agencies should treat split-estate parcels in ways similar to other parcels regarding NSO stipulations.

These split estate parcels would be managed in accordance within existing federal laws and regulations.

MN31 Public Concern: The managing agencies should designate all potential Gunnison sagegrouse habitat as NSO.

The LRMP and FEIS consider a range of alternatives to address management of Gunnison sage-grouse habitat, including a number of protective actions related to oil and gas development. An NSO stipulation is proposed for oil and gas leasing in occupied Gunnison sage-grouse habitat, and other alternatives consider these areas as not available for leasing. An NSO stipulation for potential habitat may not be necessary, as the LRMP proposes a number of other protective actions for Gunnison sage-grouse habitat. Other leasing stipulations analyzed as part of the planning process include noise restrictions, seasonal timing restrictions, and winter concentration stipulations. A complete list of lease stipulations is included in Appendix H.

MN32 Public Concern: The managing agencies should revise the assumptions regarding the future of CBM wells to better reflect current plans and information.

Assumptions regarding the future of CBM wells have been updated and revised. Please refer to the 2010 RFD and FEIS.

MN33 Public Concern: The managing agencies should require that CBM producers disclose what substances they use and how contaminated fluids would be controlled.

Currently there are Colorado State rules in place addressing this issue, as well as BLM proposed regulations. The agencies would also manage and address these issues in accordance within existing federal laws and regulations.

MN34 Public Concern: The managing agencies should revisit the analysis of mineral development to account for the increase in uranium mining and resultant impacts.

While we acknowledge the rapid change in projected activity for solid leasable and locatable mineral development, the BMPs that the federal agency would apply to proposed development plans of operation have not been lessened or altered by potential increases in activity. Protections for sage-grouse, bats, and other listed species remain in effect.

MN35 Public Concern: The managing agencies should develop standards and guidelines for uranium development to protect wildlife.

To the extent accorded by law, wildlife standards and guidelines should generally address the issues that arise due to conflicts between uranium development and wildlife. BMPs for uranium development have also been developed by the BLM, but are not reprinted in the LRMP. Sitespecific plans of operation would include BMPs that are appropriate to the proposed operation.

MN36 Public Concern: The managing agencies should reevaluate the decision to increase NSO acres because the limits of horizontal drilling were not adequately considered.

NSO stipulations are applied where we have concluded that the surface development of oil and gas is not compatible with the physical and biological resource to be protected. We realize that there is a limit to horizontal drilling reach and to both economic and technical efficiency, but we want to continue to make certain lands available for lease and to allow the lessee to determine whether to pursue leasing within the constraints required. We also recognize that surface disturbance associated with multiple wells on one pad may approach or exceed single wells on multiple pads. However, the concentration of activities to fewer well sites is a positive form of mitigation and may be appropriate in some situations. In some gas plays such as the GSGP, horizontal drilling is a standard operating procedure.

MN37 Public Concern: The managing agencies should clarify that their ability to manage the public lands is constrained by their obligations to holders of valid existing oil and gas leases.

Development of existing leases is subject to the lease terms granted. Mitigation, expressed as Conditions of Approval for lease operations would be reasonable and within the terms of the existing lease.

MN38 Public Concern: The managing agencies should clarify that the RFD scenario is not a limit or threshold on future development.

It is clearly stated in the RFD/RFD Addendum that the RFD scenario is an estimate only. The associated impacts analyzed in the LRMP are based on the number of wells in the RFD. The threshold on future development is related to these impacts and not the specific number of wells. Impacts were updated and analyzed in the Supplement to the Draft EIS and are included in the FEIS.

- MN39 Public Concern: The managing agencies should revise the RFD scenario because it is unreasonably low.
  - The RFD has been revised. Please refer to the 2010 Addendum to the RFD.
- MN40 Public Concern: The managing agencies should revise the description of the RFD scenario as it relates to high, moderate, and low potential for oil and gas development.
  The RFD was revised in 2010 to include areas of high, moderate, and low potential (see Figure 9, 2010 RFD).
- MN41 Public Concern: The managing agencies should analyze the potential effects of potash exploration and development in the FEIS and develop management guidelines for potash exploration and development.

As stated in the LRMP, the development of solid leasable minerals such as potash is subject to the same stipulations and other LRMP direction as oil and gas development. The FEIS and LRMP have been updated to better address potash exploration, development potential, and effects of development. Potential effects of specific development scenarios, such as subsidence, would be analyzed at the appropriate scale during the project-specific permitting process.

MN42 Public Concern: The managing agencies should state that potash exploration or development cannot infringe upon or restrain development of existing oil and gas leases, and should include language that allows for orderly production of both potash and oil and gas resources while not compromising valid existing rights.

The BLM has the right to develop multiple mineral estates in the same location. Junior mineral rights should not unduly interfere with a senior mineral right. However, even if there is only one mineral lease in place, the holder of any mineral lease should not develop that resource in a way that unduly impairs, contaminates, or degrades other resources, including other federal mineral resources, those that are already leased, or which may reasonably be expected to be leased in the future.

MN43 & MN44 have been combined with other Public Concerns.

## MN45 Public Concern: The managing agencies should include analysis of the impacts of the Gunnison sage-grouse stipulations upon federal oil and gas leasing.

This stipulation has been reviewed in light of its potential to impact leasing and possible production within the project boundaries. For production, it is acknowledged that under some scenarios, directional drilling for smaller tracts under an NSO stipulation related to Gunnison sage-grouse may still allow for a potential full oil and gas development of that area. For large contiguous tracts of occupied habitat, it is acknowledged that the NSO could negatively affect potential drainage of those areas, (i.e., directional drilling may not drain all resources within the NSO boundary). Waivers, exceptions and modifications could add more variability to potential development. The actual impact would be determined when the lands in question were leased and development proposed, and would be disclosed at that time in a separate NEPA analysis.

## MN46 Public Concern: The managing agencies should disclose the total effect of all the stipulations and restrictions upon energy development.

The cumulative impacts analysis in the Fluid Minerals section of the FEIS has been revised to disclose the potential impacts to mineral development by alternative due to resource restrictions within moderate and high development potential areas.

## MN47 Public Concern: The managing agencies should evaluate the potential for hydrogen sulfide in the GSGP.

There is the risk of the occurrence of  $H_2S$  in any well in the Paradox Basin drilled into the Paradox Formation and deeper (including the GSGP). There simply is the potential, and the consequences (other than air quality) primarily relate to personal safety and range from no impact on personal health to death (worst case). When encountered during drilling and completion operations,  $H_2S$  is typically flared because it is usually associated with combustible natural gas hydrocarbon components, making it a very short-term impact event even to air quality resources.

The Colorado Oil and Gas Conservation Commission (COGCC) currently requires  $H_2S$  contingency plans be submitted by operators drilling GSGP wells in the Paradox Basin in order to monitor and mitigate the risks to human health and safety. The BLM would require similar plans on federal mineral estate lands, in compliance with Onshore Order No. 6. This Onshore Order contains all the necessary mitigations to minimize risks to human health and safety when operating in  $H_2S$  prone areas.  $H_2S$  would be further addressed at the APD stage and the operator's state-required contingency plan.

# MN48 Public Concern: The managing agencies should carefully analyze and disclose cumulative impacts of the uranium mining expansion that may occur in the Uravan Mineral Belt in Mesa, Montrose, and San Miguel Counties.

Congress has assigned all authority regarding the management of uranium and associated mineral resources to the U.S. Department of Energy (DOE) on DOE leases. The BLM would analyze and disclose for cumulative effects as required by NEPA and law as exploration and operational activities occur on federal minerals under BLM jurisdiction.

## MN49 Public Concern: The managing agencies should update the 2010 Addendum to the RFD in order to responsibly analyze environmental impacts.

There has been only very limited development of GSGP drilling since the RFD was finalized and an update is not needed.

#### MN50 has been combined with other Public Concerns.

## MN51 Public Concern: The managing agencies should support assumptions that GSGP gas would not contain certain impurities.

The assumption that natural gas produced in the GSGP would be relatively free of impurities is a general assumption based on limited information from operators currently pursuing the play. In addition, we are unaware of any specialized systems that have been installed to process

impurities ( $H_2S$ ,  $CO_2$ , etc.) from natural gas in GSGP-producing wells between the well head and the sales pipeline. To our knowledge, only one well to date has encountered any  $H_2S$  while drilling the GSGP, presumably due to migration via subsurface faulting. This well was ultimately plugged and abandoned. Thus, the production of  $H_2S$ -rich gas is not a product being produced, delivered, and transported within the existing infrastructure.

# MN52 Public Concern: The managing agencies should revise the RFD's projections regarding conventional oil exploration because industry is less interested in pursuing an exploratory drilling program than the RFD indicates.

In 2006, there was significant industry interest by several operators in the GSGP and the BLM and USFS sought to ensure that this potential activity was considered and analyzed. Since that time the interest in the play has subsided with the decrease in natural gas prices. However, it is not unreasonable to expect that industry interest in the play may be re-established if natural gas prices rebound in the future. Since the RFD represents the scenario for unconstrained, oil and gas development, it is not uncommon for actual activity levels to fall below projected RFD estimates. This approach, however, allows the BLM and USFS to analyze for a scenario with maximum, reasonable projected drilling rates and surface disturbance.

## MN53 Public Concern: The managing agencies should revise assumptions of well pad disturbance because estimates in the RFD and Supplement to the Draft EIS do not match the COGCC's estimates.

With the increasing utilization of pitless, closed loop drilling systems combined with "waterless" (nitrogen or carbon dioxide) foam fracturing techniques currently being employed for horizontal completions in the area, both of with result in smaller well pad footprints, it is assumed that these surface disturbance estimates are reasonable.

## MN54 Public Concern: The managing agencies should discuss the implication of the type production curve for GSGP wells.

The "type production curve" represents only the projected production for an individual well only. In order to support the Supplement to the Draft EIS analysis and planning effort, however, additional work was performed to estimate the annual number of producers, the number of wells that would be producing annually, and the cumulative amount of annual production in both table and graphic form. An estimated 1,556 wells were expected to be continuously placed online and progressively depleted throughout the 15-year scenario period. Infrastructure considerations were then integrated into the analysis (e.g., the air quality model), with limited initial production from relatively low numbers of primarily exploratory and appraisal wells being able to either utilize much of the existing infrastructure in the area (such as pipelines) or requiring construction of only a few new smaller facilities (such as offset compressor stations). Later in the RFD scenario period, substantial production from hundreds of development wells was estimated and it was assumed that construction of larger, regional compressor stations would occur in the project area. Although this detailed annual drilling, success rate, and total production model was not presented in the 2009 RFD Addendum, it would be added as an appendix to that document and be available for public review. Such data may or may not advocate the use of a phased drilling approach in the project area.

## MN55 Public Concern: The managing agencies should discuss the implications of multiple operators in the GSGP.

The RFD Addendum does not assume that a single operator would be developing GSGP. It is expected, however, that only a very limited number of companies would be active in the play based on the history of operations in the Paradox Basin. As such, the likelihood of redundant infrastructure would be significantly reduced.

## MN56 Public Concern: The managing agencies should clearly define and explain "exploratory" vs. "development" in the RFD.

The terms exploratory, appraisal, and development wells represent common yet precise definitions developed by the oil and gas industry. The Dictionary of Petroleum Exploration,

Drilling & Production (Hyne 1991) defines an "exploratory well" as "a well drilled in order to locate an undiscovered petroleum reservoir, either by discovering a new field or a new shallower or deeper reservoir in a previously discovered field. An exploratory well can also be drilled to significantly extend the limits of a discovered reservoir." An "appraisal well" is defined as "a well drilled after a discovery well to gain more information on the producing reservoir such as the elevation of the oil-water contact. Appraisal wells are often cored. An appraisal well is a step-out or delineation well." A "development well" is "a well drilled into a producing reservoir that already is reasonably well delineated. The development well would have several producing wells on adjacent drilling and spacing units. Development wells are drilled to efficiently drain the reservoir and have very low risk." Annual projections for the drilling and completion of exploratory and development wells were provided as part of the 2010 RFD addendum and the projections were used in the FEIS analysis.

MN57 Public Concern: The RFD's assumptions that pipeline capacity would increase to fully serve projected new production from the GSGP, and that only a single new major gas transmission pipeline would be required to develop the GSGP, are unsupported by current industry proposals, permits, or other evidence.

The current pipeline assumptions are logical and general and consistent with the purpose of the RFD to estimate the case of maximum and unconstrained industry activity. Specific assumptions on location, size, or time frame for construction of any pipelines are not practical at this point. The agencies cannot speculate with any greater detail, nor can the agencies control when industry decides to address the issue. Market and economic conditions would determine when industry proposes additional pipeline(s) if and when the GSGP becomes economically viable.

MN58 Public Concern: The RFD's assumption that the availability of water would not be constrained is unsupported.

The current water availability assumption is a logical and general one and consistent with the purpose of the RFD to estimate the case of maximum and unconstrained industry activity. Additional assumptions on water availability are not practical at this point. The agencies cannot speculate with any greater detail, nor can the agencies control the potential limits on water availability. Those factors that influence the availability of water for oil and gas development are beyond the agency's control. Thus, oil and gas development would depend on currently unknown influencing factors for future water availability. Lastly, emerging technologies such as water recycling and/or waterless fracing may significantly reduce the water volumes needed to develop the GSGP.

MN59 Public Concern: The RFD's assumption that regional wellhead gas prices would match optimistic national gas price projections is unreasonable.

The assumptions in the RFD were based natural gas price forecasts released by the U.S. Energy Information Administration. If regional prices are higher or lower, there may be some related impact on pace of development. If the development scenario in the RFD results in future impacts greater than those analyzed in the FEIS, then a future plan amendment would be required.

MN60 Public Concern: The BLM should not rely on the questionable assumption that operators would have a success rate between 60% and 80% with exploratory wells in the GSGP. This assumption was developed internally and then discussed with industry counterparts and is considered reasonable. The GSGP is a regional hydrocarbon bearing source rock throughout the Paradox Basin of southwest Colorado. Of the first four initial GSGP gas wells drilled in 2006 and 2007, two were deemed discovery wells (i.e., a success rate of 50%). It is not unreasonable to assume that over time, future exploratory drilling in the play would be guided by the results of earlier drilling and an overall success rate of 60% in the first 7 years and escalating to 80% during the last 2 years of the scenario could conceivably be attained.

MN61 Public Concern: The scope of the additional oil and gas development considered in the Supplement to the Draft EIS is very narrowly focused on the GSGP, and fails to review the

impacts of numerous oil and gas developments in the broader region, including the Hovenweep. Chimney Rock, and Mancos Shale/Niobrara hydrocarbon potential.

Projections for the oil and gas developments in the broader region have been addressed in the 2006 RFD and were confirmed as still valid in the 2010 RFD Addendum. Hovenweep, Chimney Rock, and Mancos Shale/Niobrara hydrocarbon potential is still in the wildcat exploratory stage of activity in southwest Colorado. These resource plays are currently highly speculative and there is simply not enough information with which to formulate a defendable RFD scenario. If unconventional shale gas/oil plays other than the GSGP become established in the future, then the LRMP can be updated to address the new potential and its impacts.

MN62 The managing agencies should provide formal notice of the intent to withdraw lands from oil and gas leasing to comply with Section 204 of the FLPMA.

The BLM and USFS would follow all applicable laws and regulations with respect to withdrawing lands from mineral entry.

MN63 The recreational value of Haycamp Mesa is over-stated and should not be under a CSU stipulation based on recreational value; standard stipulations should be applied.

Haycamp Mesa was under a CSU stipulation in the Draft EIS because the area was identified as a "Structured Recreation Management Area;" however, this designation has been removed from the LRMP, so the associated CSU stipulation no longer applies to this area. CSU stipulations do still apply to some areas on Haycamp Mesa due to the presence of other, non-recreation related resources.

MN64 The range of alternatives of lands available for oil and gas leasing is insufficient because the number of acres under the various stipulations does not change considerably between alternatives.

The LRMP has been revised to offer an expanded range of the various leasing stipulations as they apply to each alternative. As a result, while the overall range of land available and not available for oil and gas leasing has not changed significantly from the Draft to the Final LRMP, the potential leasing and development scenarios are measurably broader based on the application of stipulations.

MN65 The managing agencies did not consider an alternative that limits oil and gas leasing in specific areas or in the entire planning area.

The USFS and BLM have analyzed an alternative that allows no oil and gas leasing, and have also presented various scenarios within the alternatives that restrict oil and gas leasing in specific areas based on the applied stipulations.

MN66 According to BLM Handbook H-1601-1, App. C. II. F. at 16, an analysis must be included in the EIS that demonstrates that the least restrictive lease stipulation that would offer adequate protection of a resource has been selected.

The BLM handbook does acknowledge that the least restrictive stipulation would be used to provide for adequate resource protection. This is ensured through the NEPA process, which is required for all oil and gas development proposals to disclose and address potential impacts to specific resources. During the NEPA process, the appropriate and least restrictive stipulation would be identified to address and protect resources.

MN67 The managing agencies must consider the Citizens Proposed San Juan Master Leasing Plan as an additional alternative in the Final LRMP and FEIS.

The Citizens Proposed San Juan Master Leasing Plan was considered and is addressed in detail in Appendix R.

MN68 The managing agencies should protect air and water resources by requiring closed loop drilling, high efficiency compressors/pumps, methane capture, renewable energy power sourcing, low or no-bleed pneumatic controls, solar-powered telemetry for well field data, or other effective measures.

Most of these ideas were incorporated as either standards, guidelines, or as mitigation measures in the Final LRMP.

MN69 The Final LRMP for the SJNF and TRFO should include a clear statement that oil and gas development within the planning area must be conducted in compliance with all fish and wildlife habitat conservation measures required by the COGCC.

All actions allowed through the LRMP on public lands must be conducted in compliance with applicable law, regulation, or policy, including requirements developed by the COGCC.

MN70 The RFD is not accurate and so the range of alternatives is not broad enough.

A revised RFD was prepared as the basis for the new information and changed circumstances which resulted in the preparation of the Supplement to the Draft EIS. The FEIS offers a broad range of alternatives.

MN71 The RFD should be revised to project additional wells, pads, and surface disturbance by incorporating recompletions.

The new RFD does take into account the variation in potential well development, including recompletions. The RFD reflects a relatively unrestricted development scenario.

MN72 The managing agencies should consider wildlife and fisheries habitat values, regulatory direction, geological suitability, and quality of experience in their determination of what lands are suitable for fluid mineral development.

The BLM and USFS have taken these values into account in developing the range of alternatives for lands unavailable for leasing, as well as stipulations for lands that are available.

MN73 The LRMP must recognize the difference between CO<sub>2</sub> production and traditional natural gas production and differentiate the proposed management direction for each type of process.

Regulations (43 CFR 3000.0(a)) explicitly define gas as "any fluid, either combustible or noncombustible, which is produced in a natural state from the earth and which maintains a gaseous or rarified state at ordinary temperatures and pressure conditions." The managing agencies are thus mandated to regulate the extraction of  $\rm CO_2$  gas identical to that of natural gas resources.

MN74 The LRMP should expressly state that collocation of wells and other facilities may not be possible for CO<sub>2</sub> production and that this guideline would only apply where technologically and economically feasible.

Recent CO<sub>2</sub> development projects within the planning area have shown that collocation of wells and other facilities is highly feasible with constraints that are directly comparable to those of oil and natural gas development projects in the area.

MN75 The LRMP should include additional surface facility density limitations and caps on total allowable surface disturbance in the GSGP area to protect unique wildlife resource values and outstanding hunting and fishing opportunities.

These recommendations were reviewed and in several cases incorporated into the revised stipulations as proposed in the LRMP.

- MN76 The LRMP/FEIS should be revised to accurately reflect the actual pad size of a GSGP well.

  A standard in the LRMP requires that operators drill with pitless closed loop drilling systems.

  Such systems do not require the use of large, excavated reserve pits (as have been previously permitted by COGCC), therefore reducing the size of the overall pad footprint.
- MN77 It is unclear whether the impacts from potential infrastructure needed to support production estimates as stated in the Supplement to the Draft EIS are analyzed; they should be included if they are not already.

The environmental impacts of pipeline development and other facilities are addressed for each impacted resource in the respective sections of Chapter 3 of the FEIS.

MN78 The LRMP should include a new standard that requires a field wide plan of development to be created when there is a request for a change in spacing order.

A master development plan would be required at the site-specific development stage and any spacing changes would be addressed during a subsequent decision process and associated level of analysis at that stage.

#### 4.20 Perins Peak Wildlife Habitat Management Area

- PE1 Public Concern: The managing agencies should include Animas City Mountain in the Perins Peak Habitat Management Area to comply with agreement CO-03 WHA-T1.

  Animas Mountain is included in the Perins Peak Wildlife Habitat Management Area in the LRMP.
- PE2 Public Concern: The managing agencies should analyze the effects of placing part of the Animas Mountain Habitat Management Area in MA 7 to provide a rationale for the management change.

Animas Mountain is included in the Perins Peak Wildlife Habitat Management Area in the LRMP.

### 4.21 Planning, Policy, Process

PP1 Public Concern: The managing agencies should develop the LRMP after the districts have prepared their Environmental Assessments to allow for development of a comprehensive, feasible, and sustainable plan and to meet their commitment to work with partners collaboratively.

All projects and activities authorized by the BLM and the USFS must be consistent with the LRMP, and activities such as travel management route determinations must ultimately be consistent with the LRMP or the LRMP must be amended through a public process. Concurrent activities by the district/field offices continue during LRMP revision under current planning guidance and appropriate regulatory and budget requirements. This LRMP revision considers appropriate public and agency input as a collaborative effort and planning is designed to be an iterative process during plan development and afterward to be able to address changing laws and demands.

- PP2 & PP3 Public Concern: The managing agencies should ensure that the BLM and USFS each execute the ROD for the FEIS and LRMP to ensure each agency is meeting its obligations to prepare land use plans and comply with NEPA.
  - There would be three separate RODs signed: a BLM LRMP Decision, a USFS LRMP Decision, and a USFS Oil and Gas Leasing Availability Decision. Each ROD would document the specifics of each separate agency decision.
- PP4 Public Concern: The managing agencies should clarify the individual legal responsibilities of the BLM and the USFS with regard to development of this LRMP.
   While many similarities exist between each agency's legal responsibilities and planning policies and practices, there are important differences that were not clearly articulated in the Draft LRMP
- PP5 Public Concern: The managing agencies should include a re-opener clause to allow for a LRMP amendment should collaborative efforts generate a new alternative that would meet the goals of the existing LRMP to encourage stakeholders to continue their collaborative efforts.

Land management planning under both BLM and USFS regulations provide a process for amending LRMP decisions based upon changing conditions.

and EIS. These differences have been clarified in the LRMP and FEIS.

PP6 Public Concern: The managing agencies should ensure that directions, standards, and guidelines in the LRMP do not exceed the authority of the agencies.

The LRMP clearly sets forth the relationship of federal land management to other management direction and relationships to local management strategies. General management principles identified in the LRMP specifically addresses the relationship the commenter makes related to Colorado State Water Law and collaborative approaches to management.

- PP7 Public Concern: The managing agencies should correct statements equating the USFS travel management regulations to the BLM's process because they are inaccurate. The discussion regarding each agency's travel management regulations and policies has been revised to address any inaccuracies.
- Public Concern: The managing agencies should revise the desired conditions to make them more specific and less vague, and to reduce redundancy.
   By definition, desired conditions are "broad-scale" goals and "overarching" aspirations, thus many are fairly general statements about future conditions of the landscape. See LRMP Section 1.4.1,
- PP9 & PP10 Public Concern: The managing agencies should manage federal lands for multiple use.

Land and Resource Management Plan Components, for a definition of desired conditions.

While purporting to support the concept of multiple use, a number of comments were focused primarily on making sure a specific use could be maintained without limitations. Both USFS and BLM guidance on developing land management plans recognize that plans need to consider present and potential uses of the public lands; consider the relative scarcity of the values involved and the availability of alternative means and sites for realizing those values; weigh long-term benefits to the public against short-term benefits; provide for compliance with applicable pollution control laws, including state and federal air, water, noise, or other pollution standards or implementation plans; and consider the policies of approved state and tribal land resource management programs that may affect the resources of the public lands. The LRMP has used a systematic interdisciplinary approach to achieve a stated balance under the principles of multiple use.

- **PP11** Public Concern: The managing agencies should add an index. An index has been added for the LRMP and FEIS.
- PP12 The LRMP does not disclose criteria for deviating from a guideline at the project level. The rationale for deviating from a guideline must be recorded as part of a project decision, accompanied by an explanation of how the intent of the guideline is being met through alternative means. At this time it is impossible to know what scenarios might warrant deviation from a guideline. See LRMP Section 1.4.1 for more information about deviating from a guideline.
- PP13 The definition of a standard implies that one can deviate from it as long as the action is analyzed and documented.

Deviation from a standard requires a land use plan amendment that would either modify the standard to allow for the deviation or eliminate the standard. The responsible official must include rationale for why an amendment is necessary and appropriate.

- PP14 The Supplement to the Draft EIS is silent on how the agencies would monitor and enforce adherence to the standards and guidelines.
  - Monitoring and enforcing adherence to standards and guidelines occurs during project-level implementation of actions allowed under the LRMP.
- PP15 The Supplement to the Draft EIS fails to consider a broad enough range of alternatives.
  The FEIS does consider a broad range of alternatives with respect to individual resource programs, areas, and when taken as a whole. The Supplement to the Draft EIS focused narrowly

on fluid mineral leasing and did not represent the full range of alternatives presented in the Draft EIS and FEIS.

PP16 The LRMP/FEIS is unclear as to what time period the 15% change in land, water, and air conditions would be measured by. A baseline condition should also be established for air and water resources to facilitate effective monitoring.

The BLM and USFS do conduct ongoing long-term monitoring of air and water resources to establish baseline conditions and to understand when trends of changing conditions occur. However 15% acceptable change is not a universal measure of a threshold of acceptable change. For example, the acceptable limit of a change for acid neutralizing capacity in a lake used to monitor atmospheric deposition is less than a 10% change from baseline conditions. The acceptable limit of change for air quality visibility in a Class I area is 5% change compared to natural unimpaired conditions. The time period is not relevant to these thresholds since the change is being measured against unimpaired natural conditions.

- The EIS must include a complete cumulative analysis.
   The FEIS contains cumulative analyses for all resources and resource programs as applicable.
- PP18 Public Concern: The managing agencies should remove references to personal communications from the Draft EIS because the public cannot review or inspect the record of such communication and to comply with 40 CFR 1502.24 and CEQ regulations.

  Statements made by agency scientists and other professionals can be an excellent source of information due to the site-specific knowledge and familiarity with the landscape they possess and may at times be referenced in the analysis. This is in full compliance with CEQ regulations at 40 CFR 1502.24 and, as they are part of the project record, these statements are available for the public to inspect.

#### 4.22 Recreation

RC1 Public Concern: The managing agencies should revise the analysis of existing recreation conditions to include a more complete and accurate accounting of existing opportunities and improve the analysis of impacts.

This comment is specific to potential reductions in motorized vehicle recreation opportunities on the SJNF and TRFO. Travel management related discussions are included in both the recreation and access and travel management sections of the FEIS. The descriptions of existing conditions found therein are intended to provide a general picture of existing opportunities (e.g. miles of roads and motorized trails), the existing variety of recreational uses (motorized and non-motorized), and to illustrate any expected changes in recreational demands due to changing societal demographics over the life of the LRMP. These sections have been reviewed and updated where necessary to be reflective of the current condition.

- RC2 Public Concern: The managing agencies should not use subjective criteria to determine recreation impacts because values conflicts are impossible to regulate.
  - User perceptions, meaning impacts to recreational users, are appropriate in an LRMP. The agency acknowledges this type of analysis is subjective but it cannot be ignored. Individual area and route designations for motorized use would analyze impacts of motorized use in more detail than this LRMP, which would include additional public involvement and more quantified analysis of impacts. Management decisions can help alleviate conflicts between users by segregating uses in time and space on the public lands.
- Public Concern: The managing agencies should balance recreation needs with the need to protect other resources when determining whether to close areas to recreational use.
  The intent of any LRMP is to balance various uses and land allocations, which includes recreation. The Preferred Alternative was developed with this intent.

RC4 Public Concern: The managing agencies should revise Recreation Objective L.2 to eliminate open areas for motorized recreation.

This comment refers to what is now Objective 2.14.59. This objective sets a 5-year timeline for eliminating cross-country motorized travel on SJNF lands and severely restricting it on TRFO lands; it does not establish or promote any open area designations. The LRMP travel decisions for over-ground motorized travel do not include any "open" areas for cross-country travel on SJNF lands and only 23 acres are designated for cross-country use on TRFO lands. Winter over-snow motorized travel suitability recommendations do allow for cross-country travel.

RC5 Public Concern: The managing agencies should not prioritize recreational uses over other uses including grazing, big game wildlife, and maintenance of large, unroaded, intact ecosystems.

As multiple-use agencies, the USFS and BLM are required to consider a variety of uses across the landscape, including recreation. Recreation tends to be concentrated along motorized roads and trails, leaving much of the area lightly, if at all, affected by intensive recreation use by the public. The Preferred Alternative makes every effort to balance uses and activities across the SJNF and TRFO in such a way to allow for multiple use and sustainability over the life of the LRMP.

RC6 Public Concern: The managing agencies should provide supporting documentation of claims that recreational uses are increasing.

The Recreation section of the FEIS contains several references and statistics that attest to the increase, and expected increase, in recreational uses on the SJNF and TRFO through the life of the LRMP. Regional population growth estimates for southwest Colorado provide another basis for expected increases in recreation uses on the SJNF and TRFO (La Plata County statistics, 2011).

- RC7 Public Concern: The managing agencies should support greater recreational use because the number of participants, trips, and activity days are increasing for many activities faster than population growth; to preserve these experiences for future generations; and to account for the increased popularity of outdoor recreation.
  - The LRMP allows for a wide variety of recreational uses to continue on the SJNF and TRFO.
- RC8 Public Concern: The managing agencies should acknowledge community support for the segregation of recreational uses.

Public involvement, as described in the FEIS, describes the process that was instrumental in guiding the development of the LRMP. In particular, highly used areas, or areas with ongoing user conflicts, were carefully analyzed in the LRMP. The LRMP contains some actions to alleviate these conflicts through area designations and travel suitability recommendations.

RC9 Public Concern: The managing agencies should substantiate claims that increasing recreational use is polarizing users.

The wording in question has been revised. Please refer to the Recreation section of the LRMP and FEIS.

RC10 Public Concern: The managing agencies should remove the unsubstantiated statements regarding recreation, specifically Cordell 1999.

Specific, statistical reference in the Draft LRMP to Cordell 1999 has been removed. References to National Visitor Use Monitoring Program surveys and general reference to Cordell 1999 are valid in that section. Specific information in third paragraph of section removed.

RC11 Public Concern: The managing agencies should revise the discussion of recreation noise impacts to use less biased language and to reflect the important role distance plays in potential disturbance.

Desired conditions regarding noise impacts have been revised to reflect this concern. Noise has been replaced with "sound". A distance of 0.5 mile from road/motorized corridors has been added to the desired condition.

- RC12 Public Concern: The managing agencies should revise the desired condition related to campsite closures to confine agency action to what is spelled out in regulations and laws. Desired conditions descriptions do not represent a discrete agency action unless specific actions to achieve them are proposed within the LRMP.
- RC13 Public Concern: The managing agencies should ensure that Native American hunting rights are upheld throughout the planning area.
   The LRMP does not make decisions that infringe upon Native American hunting rights.
- RC14 Public Concern: The managing agencies should increase recognition of horseback riding because it is a traditional use.

Motorized use has become a much more contentious issue than traditional horseback use, and therefore receives what may appear to be a disproportionate amount of consideration in the LRMP. However, that does not diminish the relative importance of equestrian use on the SJNF and TRFO, nor does that additional consideration diminish equestrian access or opportunities. Cross-country equestrian and non-motorized use is allowed nearly without exception across the planning area, and there are many areas conducive to this type of use due to terrain and the open nature of the forest/subalpine zones. Cross-country travel by motorized users is not allowed in any area of the SJNF, and on only 23 acres of the TRFO; uses are therefore segregated by default.

RC15 Public Concern: The managing agencies should include a discussion of the impacts of horseback riding.

If impacts from horseback riding were significant, they would be discussed in the LRMP/FEIS. When compared to other SJNF and TRFO-wide issues addressed in the LRMP, horseback use was not deemed a significant contributor of impacts.

RC16 Public Concern: The managing agencies should ensure that horseback riding would be permitted because horseback riding is a popular, traditional use and because horseback riding and hiking should be included among dispersed uses.

Equestrian uses are not significantly restricted by the management actions and land use allocations recommended in the LRMP. Not listing equestrian use in the referenced section does not affect equestrian access and use on the SJNF and TRFO. Such use would continue to be considered in any future NEPA analysis tiered to the LRMP.

RC17 Public Concern: The managing agencies should add horse use to the other uses mentioned for Sauls Creek, Beaver Meadows, Williams Creek, Turkey Springs, First Fork of the Piedra, and the Lower Hermosa Campground.

The omission of equestrian use in an area's description is not an indicator of the appropriateness or current level of such use in an area. The existence of trailer parking and other equestrian-related facilities explicitly allows for this type of use, and no decisions are proposed in the LRMP that would restrict horse use in the Lower Hermosa area. Horseback use is a long-standing traditional use across the planning area that would continue to be allowed unless valid reasons to restrict it are realized.

RC18 Public Concern: The managing agencies should revise the LRMP to include horseback riding as a use in the Geographic Area descriptions, HD Mountains, and Structured Recreation Management Areas.

The Structured Recreation Management Areas mentioned in the comment were not carried forward into the LRMP for the reasons described in Appendix E. This change does not affect equestrian access within those areas, and any future site-specific NEPA for those areas would be an open public process and would include consideration of equestrian use and access. A brief

description of traditional horseback use has been added to the introduction section for each of the three geographic areas.

#### RC19 Public Concern: The managing agencies should include horseback riding as a use of the Durango Special Recreation Management Area (SRMA).

SRMAs target a specific range of uses and users, and this strategy is intended to minimize use conflicts and improve public safety and enjoyment of the areas. Although horseback use is not recommended to be restricted in these areas, if that type of use is recognized and encouraged in the LRMP and subsequent SRMA plan, there are bound to be conflicts between equestrian users, hikers, and bicyclists if all uses are concentrated onto these urban-proximate trail networks.

## RC20 Public Concern: The managing agencies should not exempt mountain biking from restrictions because mountain biking should be treated the same as other recreational uses.

Bicycling is being considered in the LRMP along with the many other uses on the SJNF and TRFO in a manner to reduce user conflicts and provide for public safety. The agencies have no authority to allow mechanized use in wilderness.

## RC21 Public Concern: The managing agencies should establish designated-routes-only and open-unless-closed policies for managing mountain biking access because they are effective methods of managing heavily used areas and backcountry areas.

This topic is in some ways outside the scope of the LRMP, as this planning process does not address individual route or area designations. Those decisions would be made during travel management planning on a landscape scale. Regardless, the LRMP does not make a "designated routes only" recommendation for bicycles; this would be reserved to site-specific travel management efforts and analysis. In general, bicycles are allowed on all motorized trails and many non-motorized trails unless specifically restricted (i.e., wilderness or pedestrian only). The "user created trails" that the comment refers to are unauthorized and possibly illegal. Although mountain bike use is not restricted (in most areas) to designated/established trails, any construction of trail tread or other features requires appropriate environmental analysis and agency approval. Individual travel planning efforts, at a smaller scale, are based on the most recent and complete route inventory and would accept user group information regarding existing routes and network recommendations.

## RC22 Public Concern: The managing agencies should acknowledge that mountain biking does result in impacts including accelerated erosion, impacts on wildlife and plants, and effects on other trail users.

Impacts associated with mountain biking are considered along with other impacts from various forms of recreation across the SJNF and TRFO. A specific acknowledgement regarding impacts (or a lack thereof) from mountain biking is not necessary, and the impacts associated with this type of use are more appropriately analyzed during project-level travel management planning efforts that would continue to be conducted for the SJNF and TRFO.

#### RC23 & RC24 Public Concern: The managing agencies should not use the term "mechanized," or if they do use it they should clarify what it means.

The term "mechanized" is used throughout the document to refer to equipment that operates by mechanical means. The term "mechanical transport" is used in reference to bicycle use and is defined as any contrivance that moves people or material in or over land, water, or air that has moving parts, that provides a mechanical advantage to the user, and that is powered by a living or non-living power source. This includes, but is not limited to, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts.

#### RC25 Public Concern: The managing agencies should not combine mountain biking with motorized recreation in the consideration of impacts.

Relative impacts of various types of trail use are not quantified at this scale of analysis. At the landscape planning level, the agency is identifying in general which uses may be most appropriate in different locations across the planning area. Project-level travel management planning continues to be conducted across the planning area within smaller units and is the appropriate venue to compare the relative impacts, compatibility, and allocation of trails to the wide variety of potential uses.

#### RC26 Public Concern: The managing agencies should include standards and guidelines for ski area management.

Each ski area is analyzed under a project-specific EIS and the subsequent operating plan stems from the EIS findings. The objectives in the LRMP would help guide ski area planning and developments through the life of the LRMP, but the decisions and findings of the ski area EIS remain the binding decisions.

## RC27 Public Concern: The managing agencies should revisit the four-season focus of the desired conditions because it may not comply with the National Forest Ski Area Permit Act of 1986.

The Ski Area Recreation Opportunity Enhancement Act amended the 1986 National Forest Ski Area Permit Act to allow for multi-season uses in these areas as part of the permit.

### RC28 Public Concern: The managing agencies should include non-recreation amenities in the desired conditions for ski areas to limit the negative impacts on water, soils, wetlands, and wildlife habitat.

Ski area EISs and the subsequent operating plans mitigate significant impacts stemming from ski area developments. This LRMP does not affect existing ski area permits, authorized facilities, and activities approved in those decisions and permits. Only a modest expansion of the Wolf Creek Pass ski area is considered in this LRMP (Alternatives B and D) and that expansion would be contingent on a site-specific EIS to be prepared by the permittee in the future and subject to USFS approval.

#### RC29 Public Concern: The managing agencies should remove the reference to the Built Environment Image Guide as it applies to ski areas because it is inconsistent with earlier assurances by the agencies.

The statement implying consistency in architectural styles across the public lands has been removed.

## RC30 Public Concern: The managing agencies should correct the Draft EIS to accurately reflect the acreage of the Silverton Mountain Ski Area because the lease covers approximately 1,300 acres, not 1,201 acres.

The ski area lease covers approximately 1,300 acres while the Special Recreation Permit for heliskiing operations covers about 13,000 acres. The correction to the acreage has been made in the LRMP.

#### RC31 Public Concern: The managing agencies should correct the estimates of future downhill skier visitation.

The agency acknowledges the lack of reference for the disputed citation and has changed the increase in annual skiing days by 2050 to 14%. The reference to Cordell 1999 on Draft EIS page 3.397 indicating an anticipated rapid increase in downhill skiing visitation has been removed. The agency acknowledges the original reference to Cordell 1999 was not appropriate in this context.

#### RC32 Public Concern: The managing agencies should preserve the existing lease terms for the Silverton Mountain ski area.

This LRMP does not affect the long-term lease for Silverton Mountain, which is managed and administered by the TRFO.

RC33 Public Concern: The managing agencies should allow all ski resort-related operations as described in the Durango Mountain Resort EIS and the Special Use Permit.

This LRMP would not supersede any previous decisions regarding ski area use permits and developments; however, adjustments to permits can be made when they are renewed.

RC34 Public Concern: The managing agencies should prohibit additional ski area development in the East Fork of Hermosa Creek to protect Colorado River cutthroat trout and water quality and quantity.

No expansion of Durango Mountain Resort is being considered at this time. Any such proposal would be subject to additional NEPA analysis specific to the proposal.

RC35 Public Concern: The managing agencies should support the potential expansion of the Wolf Creek ski area to support the economy of Mineral County.

The expansion of Wolf Creek Pass ski area is included in Alternatives B and D. However, any such expansion would be fully and specifically addressed in a subsequent EIS to be prepared by the ski area and subject to USFS approval.

RC36 Public Concern: The managing agencies should not designate the Wolf Creek area as MA 3 because the designation is inconsistent with the Draft EIS analysis and it would not allow for expansion of skiing operations around Wolf Creek.

The FEIS analyzes a range of alternatives for designation of MAs on lands surrounding the Wolf Creek ski area, which reflect the varying desired uses (as communicated during scoping and public comment periods) that could occur on those lands in the future. An MA 3 designation on lands surrounding Wolf Creek, as considered in Alternative C, is not inconsistent with the FEIS analysis; this designation would emphasize uses that are different from developed ski opportunities on adjacent lands. Potential future expansion of the Wolf Creek ski area has been considered in the FEIS, though it is not analyzed in detail, and could be accommodated through MA designations as proposed in Alternatives B and D. However, the LRMP approves no such expansion; any future expansion of the ski area would require separate NEPA analysis and an associated public involvement process.

RC37 Public Concern: The managing agencies should remove the historically proposed East Fork and Wolf Creek Valley ski areas from MA 8 because currently available data do not support estimates of rapid growth in skier visitation in the future.

The FEIS analyzes a range of alternatives for designation of MAs on SJNF lands that consider the public's varying desired uses of lands, including developed ski areas. Alternatives A and D of the FEIS would accommodate a ski area proposal through an MA 8 designations for the East Fork area. The Wolf Creek Valley ski area proposal would only be accommodated through an MA 8 designation under Alternative A. Neither the East Fork nor the Wolf Creek Valley ski areas are allocated as an MA 8 under Alternatives B or C.

RC38 & RC39 Public Concern: The managing agencies should apply a management designation to the Wolf Creek area that would meet the increases in demand for heavily or highly developed outdoor winter recreation.

Expansion of the Wolf Creek ski area could potentially help meet increases in demand for developed outdoor winter recreation, and future expansion has been considered in the FEIS, though it is not analyzed in detail. Potential future expansion could be accommodated through MA designations as proposed in Alternatives B and D. However, the LRMP approves no such expansion; any future expansion of the ski area would require separate NEPA analysis and an associated public involvement process.

RC40 Public Concern: The managing agencies should not designate the Wolf Creek ski area as MA 8 because they have not sufficiently disclosed the impacts of ski area expansion and to protect lynx habitat and roadless area characteristics.

The MA 8 designation is specific to highly developed areas such as ski areas. Any future EIS analyzing ski area expansion would require USFWS consultation regarding lynx and would also address potential impacts to roadless areas.

RC41 Public Concern: The managing agencies should revise descriptions of Recreation Opportunity Spectrum (ROS) settings to acknowledge that there is no authority for excluding all human recreation activity and to clarify that primitive ROS settings include only areas recommended for wilderness designation by the USFS.

None of the ROS settings/zones exclude human recreational activity. The primitive ROS zone is used infrequently outside designated wilderness in areas typically adjacent to existing wilderness or that have outstanding wilderness values inherent to them.

- RC42 Public Concern: The managing agencies should disclose the effects of expanding the semi-primitive, non-motorized areas to include data supporting the determinations.
  ROS recommendations as mapped in the LRMP do not change (reduce or expand) route designations or motorized access opportunities. Landscape-scale travel planning efforts would be analyzed and determine the designated route networks. See the motorized travel suitability section for areas identified as "suitable with opportunities," which could lead to expanded opportunities for motorized recreation in the future.
- RC43 Public Concern: The managing agencies should revise the ROS boundaries to allow motorized access on primitive motorized trails.

ROS zones, as depicted in the LRMP maps, are an attempt to depict recreation zones and help guide future recreation management decisions. They do not represent binding land use allocations. Motorized use can be allowed in primitive and semi-primitive ROS areas on routes designated for such uses under travel management planning. The statement in question regarding the appropriateness of recreation is just that, a statement which acknowledges that recreational uses are not always appropriate in all areas. The LRMP does not base any land allocation decisions on this statement. Examples of this type of area could be archaeological sites, which are found throughout the SJNF and TRFO, or any of the several RNAs and the very specific or rare ecotypes they are being created to protect.

RC44 Public Concern: The managing agencies should ensure that mountain biking would be allowed in primitive settings in the ROS to be consistent with the MOU between the USFS and the International Mountain Bicycling Association.

The ROS settings as depicted in the LRMP maps are not binding land use decisions, and in and of themselves do not restrict bicycle use within the primitive ROS zones. Bicycle use can be allowed on trails within any ROS zone. Nonetheless, the primitive ROS zone (outside existing wilderness) comprises a very small portion of the SJNF and TRFO acreage and would not substantially affect bicycle access in future recreation/travel management planning within those limited areas.

RC45 Public Concern: The managing agencies should assign the Storm Peak, Lizard Head, and Calico IRAs the ROS of semi-primitive non-motorized to be consistent with past travel management plans.

Of the three areas mentioned, the Storm Peak and Lizard Head are IRAs. These areas would be managed under the recently adopted 2012 Colorado Roadless Rule, which includes management actions to protect roadless values. Motorized uses are not prohibited by that rule, but must be managed appropriately. The Colorado Roadless Rule supersedes the ROS zone recommendations, which are intended as area guidelines for recreation. The Calico area referenced is not an IRA analyzed in Appendix C. However, the Calico National Recreation Trail is currently open to certain types of motorized use under the travel plan for that area (Rico-West Dolores).

RC46 Public Concern: The managing agencies should change the ROS for the Calico and Storm Peak IRAs from semi-primitive motorized to semi-primitive non-motorized to reflect the non-motorized status envisioned by the 1992 plan amendment.

Calico is not included as an IRA in Appendix C. The area currently has designated motorized routes, including the Calico National Recreation Trail. Storm Peak is an IRA and would be managed under the 2012 Colorado Roadless Rule, which would supersede the ROS zone determination in the LRMP.

RC47 Public Concern: The managing agencies should clarify the ROS designations for the Perins Peak/Animas Mountain Habitat Management Area because the reason for the mixture of classifications is not apparent.

There are two ROS designations in the referenced areas; roaded natural and semi-primitive motorized. Both areas are urban-proximate and are easily accessible for recreation and the ROS designations reflect that. Existing seasonal wildlife closures would remain in effect to protect winter big-game habitat.

RC48 Public Concern: The managing agencies should revise the map of the Cortez SRMA to show Mud Springs Recreation Management Zone.

Mud Springs is now included as a Recreation Management Zone within the Cortez SRMA. The area is proposed for management as an SRMA as well as an ACEC emphasizing cultural resource protection.

RC49 Public Concern: The managing agencies should revise the descriptions of the Recreation Management Zones RMI and RM2 to identify which zone contains the Phil's East and Sam's World areas.

Appendix E provides a detailed description of, and guidance for, each proposed SRMA. The Cortez SRMA is comprised of two Recreation Management Zones: 1) the Montezuma Triangle (including Phil's World, Chutes and Ladders, Summit, and Aquaduct) and 2) Mud Springs. Chutes and Ladders refers to the area previously described as Phil's World East.

RC50 The managing agencies should ensure that recreation objectives take into account oil and gas development.

The various uses of public lands within the planning area have been considered in this planning effort, resulting in the development of standards, guidelines, leasing stipulations, and other mitigation measures aimed at ensuring that multiple uses of the public lands, including recreation and energy development, can continue sustainably into the future.

RC51 The expansion areas as proposed by the Wolf Creek ski area should be incorporated into the alternatives.

Both areas of expansion have been incorporated into the alternatives.

#### 4.23 Research Natural Areas

RN1 Public Concern: The managing agencies should clarify whether winter motorized use would be allowed in the general area proposed for RNA designation because the Draft EIS states that summer motorized use would be prohibited.

Motor vehicles (including snowmobiles and motorcycles) are prohibited in the summer and winter in all RNAs. One of the purposes of designating RNAs is to identify a reference area where natural conditions have been maintained because of a lack of human presence or management. Motorized use demands a more intensive management presence and can contribute to impacts that could adversely influence the natural integrity of the area and the purpose for which it was designated.

RN2 Public Concern: The managing agencies should discuss the environmental consequences of proposed RNAs on timber management and forest products.

Timber harvest and the collection of special forest products are prohibited in RNAs, but the overall impacts to timber management are negligible because of the small amount of overlap between the suitable timber base and proposed RNAs. The designation of RNAs would have very little or no effect on special forest products collection because special forest products are not being collected in the areas proposed for RNA designation.

## RN3 Public Concern: The managing agencies should not designate the proposed Grizzly Peak and Electra Lake areas as RNAs because of the conflicts with existing land uses. The lands in question are currently classified as "suitable" for over-snow travel in Alternatives A and B.

Motor vehicles (including snowmobiles and motorcycles) are prohibited in the summer and winter in all RNAs (including Grizzly Peak and Electra); in the Draft EIS, these areas were shown as suitable for motorized use, while the management prescriptions for RNAs clearly identified that motorized travel would not be allowed within RNAs. This contradiction has been corrected in the FEIS so that all areas proposed for RNA designation are shown as unsuitable for summer and winter motorized use.

## RN4 Public Concern: The managing agencies should not designate the proposed Hermosa area as an RNA if the associated lands would also be designated as a wilderness area because the designation is unnecessary.

The potential Hermosa RNA would be established through this LRMP, while wilderness designation would occur through an act of Congress. If the area were designated wilderness in the future, the agency would examine whether the RNA would still serve its original purpose and would still be necessary. Wilderness and RNA overlapping designations can be appropriate in certain cases as each designation has a different purpose.

## RN5 Public Concern: The managing agencies should designate Ignacio Creek as an RNA because of its old growth ponderosa pine and mixed conifer forests, and because of its other desirable attributes.

Some of the lands in the potential Ignacio Creek RNA are suitable for RNA designation because they are mostly unaltered by past management actions, because they are in a vacant livestock grazing allotment, and because they contain rare old growth ponderosa pine and mixed conifer forests. The ROD for the NSJB EIS denies access to enter those lands, but those lands are still leased and could be developed in the future if the companies who own the leases could show that they could enter those lands without causing adverse environmental impacts to the soils, water, and streams of these lands. Granting surface access would result in adverse effects that would make those lands unsuitable for RNA designation. Because of this uncertainty, the Ignacio Creek area is not recommended for RNA designation at this time.

#### RN6 Public Concern: The managing agencies should allow bicycling in RNAs because they allow hiking and the impacts are about the same.

Bicycles are prohibited in RNAs because that activity does not coincide with the basic objectives and purpose of RNA establishment, which includes maintaining natural ecological conditions and protecting against human-caused environmental disturbances. Other uses such as hiking could be restricted in an RNA in the future if it was determined that the purposes of the RNA were being adversely impacted by these uses.

#### RN7 Public Concern: The managing agencies should close the Grizzly Peak NRA to snowmobiling.

Motor vehicles (including snowmobiles and motorcycles) are prohibited in the summer and winter in all RNAs (including Grizzly Peak); in the Draft EIS, this area was shown as suitable for motorized use, while the management prescriptions for RNAs clearly identified that motorized travel would not be allowed within RNAs. This contradiction has been corrected in the FEIS so that all areas proposed for RNA designation are shown as unsuitable for summer and winter motorized use.

#### 4.24 Riparian Areas and Wetland Ecosystems

RW1 Public Concern: The managing agencies should add more soils-related objectives including one associated with fens, to ensure that the desired conditions in the LRMP can be met and to ensure that direction in the USFS's Soil Management Handbook (FSH 2509.18, including the R-2 Supplement, 1992) is met.

The Riparian Areas and Wetland Ecosystems section of the LRMP contains an objective that states that within 15 years, three fens on the TRFO and two fens on the SJNF with impaired function should be treated. This would likely include improving the soil conditions of those fens. In addition, there is a standard in the same section that long-term adverse effects to the soils in fens from management activities in or adjacent to them must not occur. There is also a guideline in the Terrestrial Ecosystem section of the LRMP that states that ground disturbance should be limited or otherwise mitigated on organic soils in order to protect the ecological integrity of these rare and unique soils. There are numerous other soils-related objectives, standards, and guidelines in both the Riparian Areas and Wetland Ecosystems and Terrestrial Ecosystems sections of the LRMP that focus on preventing adverse impacts to the soils on the SJNF and TRFO and would help ensure that desired conditions in the LRMP and direction in FSH 2509.18 can be met.

RW2 Public Concern: The managing agencies should include information on the various types of wetlands.

Riparian and wetland ecosystems on the SJNF and TRFO consist of a general type and four physiognomic types that include evergreen riparian forests, deciduous riparian forests, deciduous riparian shrublands, riparian area, and wetland herbaceous lands (which includes fens and hanging gardens) (Redders 2003). This information is included in the LRMP and was added to FEIS.

RW3 Public Concern: The managing agencies should define the spatial scale of riparian areas to ensure the design criteria for these areas are appropriately applied.

The Riparian Area and Wetland Ecosystems sections of the FEIS and LRMP describe and define riparian areas and wetlands. LRMP components for riparian areas have been rewritten for accuracy and clarification. In addition, oil and gas leasing stipulations related to perennial streams, water bodies, riparian areas, and fens include very specific buffer distances for the purpose of maintaining proper functioning condition of these areas. The definitions provided in the FEIS and LRMP, and the specific buffer distances provided in the oil and gas leasing stipulations would help ensure that LRMP components are appropriately applied.

RW4 Public Concern: The managing agencies should make Measure V.D a standard because livestock should not be allowed to consume 40% of a year's growth of cottonwoods or willows.

This standard has been converted to a guideline and revised for accuracy and clarification. The new guideline now states that livestock browsing should not remove more than 25% of the annual leader growth of hydrophytic shrubs and trees. Please refer to the Riparian Area and Wetland Ecosystems section of the LRMP.

RW5 Public Concern: The 14 G2 ranked riparian area community types that occur on SJNF and TRFO need protection.

There is a guideline in the Riparian Area and Wetland Ecosystems section of the LRMP that states that agency actions should avoid or otherwise mitigate long-term adverse impacts in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2 NatureServe Plant Community Conservation Status Ranks.

RW6 Public Concern: The managing agencies should define "desirable native plant species" and "native plant species in fens," describe the consequences to a stream if narrowleaf or Rio Grande cottonwood trees are removed, and explain if the desired conditions related to these items are associated with the HRV concept.

Native plant species (including those that occur in fens) are species that were present in an area before European settlement in that area. Narrowleaf and Rio Grande cottonwood trees are the keystone species for the narrowleaf and Rio Grande cottonwood community types, respectively. Removing narrowleaf and Rio Grande cottonwood trees from those types would remove the key ecological components of those communities, which would significantly change their composition and structure, and eliminate the stream bank stability and wildlife habitat values they provide. Desired conditions related to these items are associated with the HRV concept because native plant species dominated the vegetation during the reference period when HRV conditions prevailed.

RW7 Public Concern: The managing agencies should include the wetlands and fens associated with the Grindstone Lake/Upper Rough Canyon areas in the desired conditions to protect the high density of fens in the area.

The desired conditions related to wetlands and fens found in the Riparian Area and Wetlands Ecosystems section of the LRMP apply to the wetlands and fens associated with the Grindstone Lake/Upper Rough Canyon areas.

RW8 Public Concern: The managing agencies should clarify the expected riparian impacts from oil and gas development.

The section discussing the effects of fluid and solid minerals development on riparian areas and wetland ecosystems has been rewritten to clarify expected impacts from oil and gas development. Please refer to the Riparian Areas and Wetland Ecosystem section of the FEIS.

- RW9 Public Concern: The managing agencies should rewrite the cumulative impacts for riparian areas and wetland ecosystems to more accurately predict potential impact. The cumulative impact assessment for riparian areas and wetland ecosystems has been rewritten for accuracy and clarification. Please refer to the Riparian Areas and Wetland Ecosystem section of the FEIS.
- RW10 Public Concern: The managing agencies should not allow drilling in Hartman Draw without considerable setbacks to protect the endangered stream orchid and the nearby vineyards and orchards.

Hartman Draw and the lands adjacent to it on all sides do not occur on SJNF and TRFO, so the SJNF and TRFO have no authority over what occurs on those lands. Note that stream orchid is not a federally listed threatened or endangered species, but it is a relatively rare plant that has a NatureServe Conservation Status Rank in Colorado of S2.

#### 4.25 Recommended Wilderness Areas

RWA1 Public Concern: The managing agencies should expand the MA 1 protections to include Ice Lake Basin, Engineer Mountains, and the remainder of the IRAs in the Grizzly Peak RNA and should propose new wilderness for areas adjacent to possible wilderness in San Miguel County.

Wilderness recommendations within this LRMP are based on objective analysis, not on current or potential wilderness legislation. An RNA is being proposed in the LRMP that would provide additional protections for parts of the Grizzly Peak area. IRAs are to be managed under the 2012 Colorado Roadless Rule, which has significant limitations regarding active management projects. Areas within MA 3 (the proposed management for the areas referenced in this comment) would not allow permanent road building and has restrictions on other permanent developments such as recreation sites and prohibits commercial timber activities. Motorized travel also has significant restrictions within MA 3 zones.

RWA2 Public Concern: The managing agencies should not select and recommend areas for consideration in the Wilderness Preservation System out of a belief that they have a "private right to act" because the continuous expansion of the Wilderness Preservation System by repeated re-inventories of the same lands is not supported by the Wilderness

Act, FLPMA, or NFMA; because the agencies have no legal authority to retain core undeveloped lands or to maintain large contiguous blocks of undeveloped land; and because the USFS does not have the authority to recommend wilderness designation or to add any acreage to the roadless or WSA inventories.

Only Congress has the authority to designate wilderness. The USFS, through the land use planning processes, serves to inform Congress which public land areas meet Wilderness Act criteria for wilderness designation. The BLM and USFS have authority to conserve and manage natural resources under a multiple use umbrella. Not all land uses can occur within the same areas without compromising resource values. The agencies seek a balanced approach to land management that does include protection for areas as undeveloped due to the unique values and resources found in those areas. Through the land use planning process, the USFS can and does make wilderness recommendations, which are not to be confused with actual wilderness designation. In this case, only a small fraction of the planning area's CRAs are recommended for wilderness.

RWA3 Public Concern: The managing agencies should designate the Hermosa Creek area as wilderness to provide an area that is free from motorized and mechanized use.

The USFS does not have authority to designate wilderness areas. However, Alternatives B and C

recommend various areas as wilderness, including part(s) of the Hermosa drainage. Away from primary trail corridors, the area already provides abundant opportunities to recreate without encountering bicycles or motorized vehicles.

RWA4 Public Concern: The managing agencies should acknowledge that wilderness designation of the Hermosa Creek area would leave no viable alternative route for mountain bikers traveling along the Colorado Trail.

If Congress were to designate lands as wilderness according to the LRMP recommendations, mountain biking would likely be prohibited on the Colorado Trail within the portion that lies within the Hermosa recommended wilderness area.

- RWA5 Public Concern: The managing agencies should designate the Hermosa-Hesperus Peak area as wilderness and establish a non-motorized trail in Bear Creek.
  Although the USFS can make wilderness recommendations, wilderness designation is reserved to Congress. Future trail developments, such as the Bear Creek trail mentioned in the comment, are site-specific actions to be analyzed under separate project-level NEPA processes.
- RWA6 Public Concern: The managing agencies should designate the Hermosa-Hesperus Peak area as wilderness to protect the entire watershed plus the headwaters of Bear Creek.

  Although the USFS can make wilderness recommendations, wilderness designation is reserved to Congress. Other MA classes in the LRMP contain protections for areas (e.g., MAs 1 and 2), thus wilderness is not the only tool for protecting special or sensitive watershed areas within the LRMP.
- RWA7 Public Concern: The managing agencies should not designate East Hermosa Creek as wilderness because it already is a nationally known single-track destination.

  The Preferred Alternative (Alternative B) does not recommend areas east of Hermosa Creek for wilderness designation, thus not affecting bicycle use along the Hermosa Creek Trail.
- RWA8 Public Concern: The managing agencies should support a possible redrawing of the current proposed Hermosa wilderness boundaries to accommodate the bicycle lobby's concerns.

Through the LRMP, the USFS recommends that the western portion of the Hermosa area be designated as wilderness in Alternative B, which, if enacted by Congress, could have the effect of prohibiting mountain bike use on a portion of the Colorado Trail. The USFS is aware of and values the local discussions that have resulted in alternative proposals for this area and would participate as allowed by law in any Congressional proposal that addresses these lands and their various uses.

- RWA9 Public Concern: The managing agencies should designate Treasure Mountain IRA as wilderness to preclude consideration of the one-time proposed Wolf Creek Valley ski area.

  Although the USFS can make wilderness recommendations, wilderness designation is reserved to Congress. Areas are recommended for wilderness based on the purposes set forth in the Wilderness Act, and not necessarily to preclude potential alternative uses of the land.
- RWA10Public Concern: The managing agencies should propose wilderness designation for portions of the San Miguel IRA to link the Weminuche and South San Juan wilderness areas.

The geographic location of the San Miguel IRA does not lend itself as a linkage corridor between the Weminuche and South San Juan wilderness areas. Appendix C describes the rationale for not recommending this area as wilderness, and the LRMP designates the area as MA 3 to protect roadless area values from being compromised by development.

RWA11Public Concern: The managing agencies should revise the map of the proposed Hermosa wilderness to ensure that there is no conflict between the proposed wilderness and the Special Use Permit of the San Juan Ski Company.

As currently mapped, there is only about 7 acres of overlap between the San Juan Ski Company permit boundary and the proposed Hermosa wilderness bill map. This particular area is small and of little actual ski value due to its slope aspect and lack of accessibility. Therefore, if the wilderness were designated as currently mapped there would be an insignificant to nonexistent impact on the ski operation.

RWA12Public Concern: The managing agencies should evaluate the effects on management and values of adjacent lands as a consequence of wilderness designation because such an evaluation is mandated by USFS Title 36 regulation.

The areas recommended for wilderness designation in the Preferred Alternative have been carefully selected and this process has included assessing potential effects of their possible designation by Congress as wilderness. Only the west Hermosa area is not adjacent to existing wilderness, and this particular recommended area has been developed considering such issues as mineral rights, ski area operations, motorized/mechanized uses, etc.

RWA13Public Concern: The managing agencies should consider whether areas serve as linkages in landscape-scale ecosystems in the analysis of wilderness suitability.

The use of Treasure Mountain as a Canada lynx linkage corridor between the Weminuche and South San Juan wilderness areas is only a small component to a wilderness recommendation. Lynx are protected through the ESA and the recommendation of Treasure Mountain CRA for wilderness designation would not in itself add protection to the species. The CRA is proposed as a MA 3 and has the stated goal of maintaining a relatively unaltered land where natural ecological processes operate mostly free from human influences.

#### 4.26 Soils

SO1 Public Concern: Soil erosion and sedimentation from roads used for timber harvest activities have been reduced compared to what they used to be, and there is reason to expect that they would continue to be reduced in the future.

Impacts to uplands soils are discussed in the FEIS under the Terrestrial Ecosystems section. This includes a discussion on impacts from past management activities, and the environmental consequences of future management activities, including timber harvest. As stated in this section, impacts to soils from timber harvest are dependent on many factors, but given the application of standards and guidelines, soil erosion should be short-lived, localized, and would affect a relatively small number of acres. Refer to the Terrestrial Ecosystems section of the FEIS for more information.

SO2 Public Concern: The managing agencies should strengthen the desired conditions and design criteria for soils.

Soils is now included in the Terrestrial Ecosystems section of the FEIS and LRMP. Many of the LRMP components related to soils have been rewritten. Please refer to the Terrestrial Ecosystems section of the LRMP.

- SO3 Public Concern: The managing agencies should revise the discussion of soil erosion and water quality related to the Missionary Ridge fire because it understates the effects.
  Soils is now included in the Terrestrial Ecosystems section of the FEIS. The information referred to in this comment regarding soil erosion and water quality related to the Missionary Ridge fire has been deleted.
- SO4 Public Concern: The managing agencies should restrict grazing on areas containing bunchgrasses and biological soil crusts to increase the abundance and distribution of these resources.

Bunchgrasses and biological soil crusts, which are important ecological components on the SJNF and TRFO, would be protected by LRMP components found in the Terrestrial Ecosystems and Livestock and Rangeland Management sections of the LRMP. Specifically, there is a guideline in the Terrestrial Ecosystems section of the LRMP that states that management activities in areas with biological soil crusts should be designed to minimize adverse impacts to the soil crusts. Many of the LRMP components in the Livestock and Rangeland Management section would help ensure that bunchgrasses are maintained, that herbaceous plant species and utilization guidelines be identified at the project level, that season-long grazing in individual units be phased out, and that provide for periodic rest to forage species during critical growing seasons. Implementing LRMP components and achieving desired conditions should maintain or increase the abundance and distribution of bunchgrasses and biological soil crusts across the SJNF and TRFO.

SO5 Public Concern: The managing agencies should clearly define how NSO stipulations apply to soils, and "erodible soils" should be defined.

An NSO stipulation would be applied to several specific soil survey map units prone to mass movement. In addition, a CSU stipulation would be applied to lands with shale soils, lands with gypsum soils, and lands with biological soil crusts. Appendix H shows a list of the soil survey units with NSO and describes the purpose, justification, exceptions, modifications, and waivers associated with each NSO and CSU stipulation. Erodible soils are defined as soils that are highly susceptible to detachment and movement when disturbed (this term now appears in the glossary).

SO6 Public Concern: The managing agencies should add standards for soil protection to prevent irreversible damage and should change the current guidelines for soils into standards.

There are several standards in the LRMP that would provide for soil protection and prevent irreversible damage, including one that prevents the construction of new permanent roads and utilities in protected areas (which make up approximately 47% of terrestrial ecosystems on the SJNF and TRFO). NSO leasing stipulations would also be applied to several specific soil survey map units prone to mass movement, and CSU leasing stipulations would be applied to lands with shale soils, lands with gypsum soils, and lands with biological soil crusts. Both the LRMP components and the special lease stipulations found in Appendix H would help protect soils and prevent irreversible damage to the soil resource.

SO7 Public Concern: The managing agencies should revise the direct and indirect impacts to soils and remove the reference to "soil productivity" as they are too vague and better addressed at the project level.

Soils is now included in the Terrestrial Ecosystems sections of the FEIS and LRMP. The direct and indirect impacts for soils have been revised for accuracy and clarification. A definition of the term "soil productivity" is included in the glossary. It is defined as the inherent capacity of a soil to support the growth of specified plants or plant communities.

SO8 Public Concern: The managing agencies should remove or revise the impacts to soils and vegetation from atmospheric deposition of nitrogen and move discussions of water quality and vegetation to those resource sections.

Soils are now discussed as part of the Terrestrial Ecosystems section. The paragraph on atmospheric deposition of nitrogen describes potential effects to the soils and vegetation communities on the SJNF and TRFO based on non-local studies, but we think that those studies are relevant to soils in general and that they can be applied to this area.

SO9 Public Concern: The managing agencies should revise the cumulative impacts analysis for soils in the Paradox Basin because the impacts are overstated.

The cumulative impacts analysis for soils has been revised and specific reference to impacts occurring over a large scale for up to 30 years has been deleted.

#### 4.27 Special Status Species

Public Concern: The managing agencies should clarify the role and validity of "SJNF and TRFO Highlight Species" to ensure compliance with FLPMA and NFMA and should clarify the roles and obligations of the different agencies with regards to special status species management.

Highlight species were used as a planning tool in the development of the LRMP's ecosystem management approach. Certain species representing a broad spectrum of conditions and needs across the planning area were selected in order to develop a strategy around those conditions and needs. Highlight species have no legal status, and no specific BLM or USFS policy or direction associated with them; they serve no further functionality past development of the ecosystem management approach and various LRMP components. Special status species on TRFO and SJNF lands include federally listed species, species proposed for federal listing, candidate species for federal listing, Region 2 Regional Forester's sensitive species, and Colorado BLM State Director's sensitive species. The roles and obligations of each agency regarding special status species are explained under the heading of Biological Diversity and Population Viability in Section 2.1.4 – Ecosystem Management. LRMP components and design criteria for special status species have been reviewed and rewritten for accuracy and clarification where needed.

- SS2 Public Concern: The managing agencies should manage Gypsum Valley cateye as a sensitive species until the plant is granted BLM sensitive status.
   Gypsum Valley cateye is now designated as a BLM Colorado State Director's sensitive species and would be managed as such.
- SS3 Public Concern: The managing agencies should ensure that species that should be treated as sensitive or management indicator species be added to the LRMP to avoid confusion. Compiling sensitive species lists involves consideration at the BLM state and USFS regional levels and does not involve analysis at the BLM area/national forest planning level. It is therefore not within the scope of this analysis. BLM and USFS sensitive species are subjected to rigorous consideration before being included into the sensitive species program. These lists and candidates are reviewed periodically for conformance to program criteria by the state and regional offices for adjustments to the species lists. All LRMP components (including standards and guidelines) regarding special status species have been reviewed and rewritten for clarification and accuracy where needed.
- SS4 Public Concern: The managing agencies should add northern leopard frog, American pika, boreal toad, and burrowing owl to the list of sensitive species because they are all special status species.

Compiling sensitive species lists involves consideration at the BLM state and USFS regional levels and does not involve analysis at the BLM area/national forest planning level. It is therefore not within the scope of this analysis. BLM and USFS sensitive species are subjected to rigorous consideration before being included into the sensitive species program. These lists and

candidates are reviewed periodically for conformance to program criteria by the state and regional offices for adjustments to the species lists.

SS5 Public Concern: The managing agencies should revise Measure VII.A to indicate that Knowlton's pincushion cactus would be avoided during project design and implementation because it is an endangered species, and should rewrite Measure VII.D so that livestock grazing practices that result in a decrease in the abundance or distribution of Knowlton's pincushion cactus would be changed.

There are no known populations of Knowlton's pincushion cactus on the SJNF or TRFO, but potentially suitable habitat for this species does exist within the planning area. A standard has been added to the LRMP that states that projects or activities in habitat occupied by federally listed plant species, or in designated critical habitat, must be designed and conducted in a manner that preserves the primary constituent elements needed to sustain the life history processes of those federally listed plant species. All relevant laws, regulations, and policies regarding the management of federally listed plant species would be followed in the implementation of the LRMP.

#### 4.28 Scenery and Visual Resource Management

- SV1 Public Concern: The managing agencies should give equal weight to aesthetic uses and commodity values in the analysis process.
  - The EIS contains a range of alternatives that represent various mixes of multiple uses on public lands. It is not the intent of the alternatives to be the same as each other or to offer equal measures of commodity vs. amenity. Each alternative offers a different balance of commodity uses and aesthetic uses, and amenity values.
- SV2 Public Concern: The managing agencies should not impose Visual Resource Management (VRM) Class II restrictions on lands outside the McKenna Peak WSA in order to create a buffer because the agencies have already leased these lands for oil and gas development. These areas have been assigned the VRM Class II to protect the visitor experience/recreation setting that this class offers. The inherent landscape character and viewing distances make it possible to implement energy developments while maintaining a VRM Class II. A VRM II does not preclude energy or other developments but requires careful development to meet the Class II standard.
- SV3 Public Concern: The managing agencies should acknowledge that neither VRM Class I nor VRM Class II requires an NSO stipulation to comply with the BLM's Handbook.
  The BLM does not require that VRM Class I or II areas have an NSO stipulation. However, the SJNF and TRFO LRMP can include NSO stipulations on some VRM Class I and II areas as an appropriate and effective management practice for visually sensitive landscapes. The NSO stipulations would apply to new leases, not existing leases.
- SV4 Public Concern: The managing agencies should revise the VRM designations to account for existing oil and gas leases and other existing resource uses to comply with existing case law.
  - BLM VRM classes as described in Handbook 8431-1 indicate that multiple resource activities can occur within VRM Class II areas. However, it is within the authority of the BLM to assign an NSO stipulation to some VRM Class II areas that are particularly visually sensitive on the SJNF and TRFO and include scenic byways, river corridors, and scenic trails. The SJNF and TRFO LRMP has alternatives with VRM classifications that are intended to be consistent with existing lease rights.
- SV5 Public Concern: The managing agencies should ensure that all MA 8 lands receive a Scenic Integrity Objective (SIO) designation of "low" to reduce potential future management conflicts.

The entire Durango Mountain Resort special use permit area is designated low SIO and is all within MA 8. MA 8 no longer applies to Silverton Mountain, and this area would be designated as VRM Class II because there are no "cut" and managed ski runs. The permit area remains predominantly natural appearing.

## SV6 Public Concern: The managing agencies should designate the Snaggletooth portion of the Dolores River Canyon Special Management Area a VRM Class I because the area represents a unique visual resource.

The Dolores River Management Plan calls for the Snaggletooth segment of the river to be managed as a VRM Class II, which is basically the same as the inventory class for that area. The presence of the road (below Mt. Sheep Point) and power line are contributing factors to that decision.

### SV7 Public Concern: The managing agencies should revise Desired Conditions 17.1 through 17.10 to state that the new VRM restrictions cannot be applied to existing oil and gas leases.

Agency planning policy requires that a plan revision identify VRM classes and SIOs for every acre on BLM and NFS lands, respectively. The desired conditions are accompanied in the LRMP by standards and guidelines and stipulations that guide how projects would comply with the LRMP's desired conditions. The LRMP requirements would apply to all energy development on SJNF and TRFO no matter if it occurs on already leased lands.

#### SV8 Public Concern: The managing agencies should revise Table 3.22.4 to reflect the Onshore Oil and Gas Order Number 1.

The table referred to in this comment is now Table 3.15.5. This table pertains to oil and gas facilities that are currently in operation, not pads that have been fully reclaimed. Interim reclamation, as referred to in the Onshore Oil and Gas Order, occurs after initial construction and development of a facility and minimizes the overall footprint of a well pad, but does not wholly reclaim a site, so the direct impacts disclosed in the table are valid for operating wells. Complete reclamation would not occur until after the operational life of the well, which often takes up to 25 years or more.

## SV9 Public Concern: The managing agencies should revisit the visual impact analysis for oil and gas because most well structures do not impact views from the background or middle ground zones.

All oil and gas developments on current or potential future lease areas would be subject to BMPs, standard or more restrictive lease stipulations, and in many cases further stipulations through the site-specific APD process. With appropriate application of visual mitigation in siting, design, and construction of new developments, it is expected that all projects can be implemented in a manner that meets VRM/SIO objectives within the high oil and gas potential areas.

#### SV10 Public Concern: The managing agencies should clarify the visual screening requirements because they could increase costs sufficiently to preclude development of leases.

All oil and gas developments on current or potential future lease areas would be subject to BMPs, standard or more restrictive lease stipulations, and in many cases further stipulations through the site-specific APD process. With appropriate application of visual mitigation in siting, design, and construction of new developments, it is expected that all projects can be implemented in a manner that meets VRM/SIO objectives within the high oil and gas potential areas.

## SV11 Public Concern: The managing agencies should reduce the SIO from "high" to "moderate" or "low" for the lands on the east side of U.S. Highway 550, across from the Durango Mountain Resort.

Existing developments under Durango Mountain Resort's use permit would not need to be altered due to the high SIO designation. All future developments would require site-specific environmental analysis that would take into account potential visual impacts. Trails are typically acceptable within high SIO areas, and their design/construction can be modified to protect scenic

integrity (e.g., non-linear design, partial vegetation/tree thinning, scalloping clearance edges, etc.). Trailhead developments, although not acceptable within high SIO areas, are by default located adjacent to open roadways and would therefore not be expected to be built within the body of the subject high SIO area. Using this reasoning, trailhead and parking facilities would not be entirely excluded from the high SIO area, but their construction in such a location may entail some design/siting modifications to reduce visual impacts to/from the adjacent high SIO areas. The high SIO designation is intended to protect the current state of the high-quality viewshed that forms the backdrop for the Durango Mountain Resort, the U.S. Highway 550 corridor, and other nearby forest lands.

SV12 Public Concern: The managing agencies should classify the BLM portion of Paradox Basin as VRM Class IV.

The BLM portion of the Paradox Basin represents a wide range of landscapes with unique visual resources. Included within this broad geologic formation are features such as Disappointment, Dry, and Gypsum Valleys, the Dolores River Canyon including a 17,000-acre WSA, the Spring Creek Wild Horse Herd Management Area, the 21,000-acre McKenna Peak WSA, and multiple mesas. A Visual Resource Inventory (VRI) has been completed that found the full range of existing scenic values represented in this basin. During the LRMP process, VRM classes and VRM class boundaries are free to follow VRI Classes and VRI class boundaries, or to be wholly different from them. VRM classes reflect management objectives for allowable levels of visual modification inclusive of other resources and administrative responsibilities. As such, the BLM is not considering only one VRM class for this diverse landscape, but rather a spectrum of management classes. Under Alternative B, the management classes would range from VRM Class I for the WSA; VRM Class 2 primarily in the Dolores River Canyon, the Herd Management Area, and certain lands that would be managed to maintain their wilderness characteristics: VRM Class III throughout the majority of the remainder of the unit that encompasses oil and gas production facilities in Dry Creek Basin and Horse Range Mesa, and existing uranium mines in Big Gypsum Valley; and VRM Class IV generally associated with DOE uranium lease tracts.

#### 4.29 Terrestrial Ecosystems

- TE1 Public Concern: The managing agencies should revise the Terrestrial Ecosystem objectives to have time frames consistent with the life of the LRMP.
  The time frames for the Terrestrial Ecosystem objectives were reviewed and changed where necessary to be consistent with the typical lifespan of an LRMP.
- TE2 Public Concern: The managing agencies should include objectives for regionally significant vegetation types, including objectives to address the integrity of alpine vegetation in the Silverton area and the integrity of the pinyon-juniper forest. The LRMP includes objectives for the spruce-fir forest, aspen forest, cool-moist mixed conifer forest, warm-dry mixed conifer forest, ponderosa pine forest, semi-desert shrublands and grasslands, and alpine areas, which are major vegetation types on the SJNF and TRFO that represent a significant portion of the total acreage in the Southern Rocky Mountains and Colorado Plateau Ecoregions. Although the LRMP does not have specific objectives for the pinyon-juniper woodland vegetation types, it provides desired conditions and design criteria for this type, which would help to protect their ecological integrity and the native species associated with them. Please refer to the Terrestrial Ecosystems section of the LRMP.
- Public Concern: The managing agencies should revise Objective F.2 (increasing the young aspen development stage) to reflect current data on aspen regeneration.
  Objectives regarding aspen forests have been reviewed and rewritten where necessary to reflect current data on aspen regeneration. Please refer to the Terrestrial Ecosystems section of the LRMP.
- TE4 Public Concern: The managing agencies should include Gray's Townsend daisy and the riparian natural communities of boxelder-narrowleaf cottonwood/red osier dogwood

forest, strapleaf willow shrubland, and narrowleaf cottonwood-rocky mountain juniper as unique resources in the HD Mountains.

Gray's Townsend daisy and the riparian natural plant communities of boxelder-narrowleaf cottonwood/red osier dogwood forest, strapleaf willow shrubland, and narrowleaf cottonwood-rocky mountain juniper forest have been added to the HD Mountains section of the LRMP as important resources.

Public Concern: The managing agencies should protect the old growth ponderosa pine in the Smoothing Iron MA 2 special interest area because the existing old growth concentration can be used as the focus to create larger forests.

The Smoothing Iron area is within MA 2. Areas within MA 2 are considered special areas and are managed in order to protect or enhance their unique characteristics. The Smoothing Iron area was designated as MA 2 because of the presence of old growth recruitment areas. Management in these areas would focus on the protection and enhancement of this unique characteristic.

TE6 Public Concern: The managing agencies should designate old growth ponderosa pine forest restoration sites as MA 2.

Ponderosa pine stands with significant old growth attributes (and lands adjacent to those stands) in the Smoothing Iron and House Creek areas were identified as ponderosa pine old growth forest recruitment areas and designated under MA 2 as special or unique areas.

- Public Concern: The managing agencies should protect old trees and old growth forests.
  Old trees (including aspen) and old growth forests are protected on the SJNF and TRFO through LRMP components found in the Terrestrial Ecosystems section of the LRMP, and through the application of a CSU stipulations for oil and gas development in old growth forests and woodlands.
- Public Concern: The managing agencies should include an objective to prioritize TE8 increasing the proportion of spruce-fir and cool-moist mixed conifer forests exhibiting old growth characteristics to help move these forests toward desired conditions As shown in Table 2.2.1 in the LRMP, the current percentage of spruce-fir forests in old growth (26.5%) is within the desired range (25%-35%). The current percentage of cool-moist mixed conifer forests in old growth (17%) is slightly below the desired amount (20%-30%). Although the LRMP does not contain an objective to increase the proportion of cool-moist mixed conifer forests that are in the old growth development stage, it does contain a guideline that states that if the desired conditions for the development stage of a terrestrial ecosystem type are underrepresented, management activities should be designed to move that development stage closer to the desired conditions, and another that states that within landscapes not meeting desired conditions for old growth, mixed conifer forest stands that currently are not in the old growth development stage, but that contain significant old growth attributes should be prioritized as old growth recruitment areas, largely based on tree age and distribution across the SJNF, and managed for their old growth values.
- TE9 Public Concern: The managing agencies should have standards and guidelines for the recruitment of old growth stands including ones associated with their distribution on suitable and unsuitable timberlands.

There are guidelines in the LRMP that state that within landscapes not meeting desired conditions for old growth, ponderosa pine forest stands, and mixed conifer forest stands that currently are not in the old growth development stage, but that contain significant old growth attributes should be prioritized as old growth recruitment areas, largely based on tree age and distribution across the SJNF, and managed for their old growth values.

TE10 Public Concern: The managing agencies should revise Table 41 to revise snag requirements.

The table referred to in the comment showing desired conditions for snags and large wood is now Table 2.2.3 in the LRMP. This table has been revised.

#### TE11 The managing agencies should provide a better definition of snag to clarify the relationship between Guideline A.40 and Standards A.41, A.42, and A.43.

These guidelines have been deleted. LRMP components regarding snags have been revised and placed in the Terrestrial Ecosystems section. A definition of the term "snag" is provided in the glossary as a standing dead tree.

#### TE12 Public Concern: The managing agencies should include a standard requiring retention of larger snags.

The desired conditions for snags and large wood on the SJNF and TRFO were reviewed and revised. The changes made include refining the number of snags per acre desired in different size classes for spruce-fir, cool-moist mixed conifer, aspen, warm-dry mixed conifer, and ponderosa pine forests. The revised table showing desired conditions for snags and large wood is included in the Terrestrial Ecosystems section of the LRMP.

## TE13 Public Concern: The managing agencies should require retention of larger down dead pieces in spruce-fir and cool-moist mixed conifer forests to provide moisture retention, erosion reduction, and wildlife habitat.

The desired conditions for snags and large wood on the SJNF and TRFO were reviewed and revised. The changes made include refining the number and size of snags per acre desired in spruce-fir, cool-moist mixed conifer, aspen, warm-dry mixed conifer, and ponderosa pine forests. The revised table showing desired conditions for snags and large wood is included in the Terrestrial Ecosystems section of the LRMP.

#### TE14 Public Concern: The managing agencies should protect the old growth ponderosa pine forests.

LRMP components in the Terrestrial Ecosystems section are expected to be sufficient to protect old growth in all vegetation types.

## TE15 Public Concern: The managing agencies should clarify the second sentence of the last paragraph on page 27 of the Draft EIS, in regard to the term "unmanaged," and clarify the scale that that sentence refers to.

The term "unmanaged" in this context refers to historic livestock grazing that occurred prior to the areas being managed by the USFS or BLM.

## **TE16** Public Concern: The managing agencies should define "landscape linkage areas." Linkage areas are defined in the glossary as areas that provide connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where basins, valleys, or agricultural lands separate blocks of lynx habitat, or where lynx habitat naturally narrows between blocks.

#### TE17 Public Concern: The managing agencies should clarify the potential impacts to special biological diversity features from oil and gas development.

Even though oil and gas development could quadruple, impacts to special biological diversity features would be minimal because these areas are protected by NSO stipulations. Please note, for organizational consistency the Special Biological Diversity Features section has been moved into Terrestrial Ecosystems and Riparian Areas and Wetland Ecosystems.

## TE18 Public Concern: The managing agencies should define what "rare or unique vegetation types" and "structural representations" are, where they are, and if industry would have access to them.

In the Mineral and Energy: Fluid Minerals section of the FEIS, the words "those rare or unique vegetation types or structural representations" were used to describe old growth forests, special botanical areas, and RNAs. Special lease stipulations would be applied at the lease issuance stage to old growth forests and woodlands (CSU), special botanical areas (NSO), and RNAs (NSO). Appendix H shows all special lease stipulations and describes the purpose, justification, exceptions, modifications, and waivers associated with each NSO and CSU stipulation. Maps

showing the location of special botanical areas and RNAs can be found in the FEIS. Old growth areas are typically determined at the project level and are not shown on maps in the FEIS or LRMP.

TE19 Public Concern: The managing agencies should revise the discussion of impacts on unroaded areas to clarify that lightly used roads do not cause habitat fragmentation. The Special Biological Diversity Features section of the Draft EIS was deleted along with the associated "unroaded lands" paragraph and the Dobson et al. (1999) reference. Information related to unroaded and undeveloped lands on SJNF and TRFO and their ecological significance is now located in Section 2.1 – Ecological Framework and the Conservation of Species.

#### 4.30 Timber Management and Special Forest Products

TM1 Public Concern: The managing agencies should clarify whether desired conditions vary between lands that are suitable or not suitable for timber production.

Desired conditions for timber and other forest products have been revised. Desired conditions now reflect efforts to "maintain[s] or improve[s] ecosystem function, resilience, and sustainability" when conducting "forest vegetation management that results in, among other objectives, meeting needs or demands for forest product offerings." Note that this is just one of eight conditions that the SJNF would strive to meet when timber products result from forest vegetation management. Also note that the desired condition to maintain or improve ecosystem function falls across lands classified as "suitable" or "not suitable" for timber production. We do not believe in pursuing forest vegetation treatments—on suitable or not suitable lands—that could compromise ecosystem function in the long term. The range of forest vegetation conditions and associated functions are highly complex and varied, and best suited, to be addressed in project-level analyses.

TM2 Public Concern: The managing agencies should revise Desired Condition 19.1 to include commodities and contributions to local economies.

The desired conditions regarding timber have been rewritten for consistency and clarification. Please see the Timber and Other Forest Products section of the LRMP.

TM3 Public Concern: The managing agencies should add a desired condition that identifies timber harvest as a strategy for restoring ecologically desired forest conditions because the current desired conditions fail to identify restoration of degraded forests as a desired outcome.

The approach taken with the LRMP in regards to desired conditions is to state desired conditions that are reached through management. Given the comments above, we feel that "program objectives" is the section of the LRMP best suited to disclose the tools that would be used to meet desired conditions. There are several areas where program objectives speak to the appropriate use of timber harvest to achieve desired conditions. For instance, there are five different program objectives, under Terrestrial Ecosystems, that speak to the use of harvest to meet differing objectives in various cover types. There are numerous other areas in the LRMP, or FEIS, that make mention of timber harvest as a means to meet forest vegetation goals.

TM4 Public Concern: The managing agencies should consider removing slash from areas that would be subject to prescribed burn.

The design criterion dealing with slash from mechanical forest vegetation treatments has been revised to better apply to the treatment(s) and forest cover type in question, allowing flexibility to adjust to differing site conditions. Please refer to the Terrestrial Ecosystems section of the LRMP.

TM5 Public Concern: The managing agencies should revise Objective P.3.2 to ensure it is consistent with other direction in the LRMP regarding the quantity of harvest of cool-moist conifer and spruce-fir forests.

The objectives regarding timber have been rewritten for consistency and clarification. Please see the Timber and Other Forest Products section of the LRMP.

#### TM6 Public Concern: The managing agencies should provide detailed descriptions of desired slash levels.

The guideline for managing slash has been rewritten. Please refer to the Terrestrial Ecosystems section of the LRMP. Please note that detailed descriptions of desired slash levels are best addressed in project-level analyses, given the wide range of site conditions that could occur.

## TM7 Public Concern: The managing agencies should ensure that proposed timber suitability is consistent with Guideline II.D for soils to protect watersheds that are most sensitive to anthropogenic disturbance.

Most of the watersheds sensitive to anthropogenic disturbance are found on the west side of the forest and are associated with high gradient streams and steep canyon side slopes. Although the entire watershed is labeled as sensitive, the real concern lies with the streams and the canyon slopes. During the process of determining lands suitable for timber production (as per NFMA), lands where irreversible soil damage may occur if timber management treatments are implemented are removed from the suitable base. In this process the canyon side slopes and valley bottoms were removed from suitability. The intent of including the watersheds most sensitive to anthropogenic disturbance in the Draft LRMP was to highlight watersheds that may have site specific concerns as a coarse filter, but not necessarily to say that disturbance cannot occur in them.

#### TM8 Public Concern: The managing agencies should resolve conflicts between the LRMP and timber contracts in regards to slash loads.

A guideline addressing slash resulting from forest vegetation treatments has been revised for accuracy and clarification. Please refer to the Terrestrial Ecosystems section of the LRMP.

#### TM9 Public Concern: The managing agencies should increase the number of seedlings per acre to certify adequate conifer regeneration.

The number of seedlings required to restock a conifer stand can vary widely—both within stands and from stand to stand—and is based on a silvicultural prescription written by a certified silviculturist. The minimum number in Table 2.9.3 is just a minimum, and may be increased based on the prescription, or a prescription may only require as few as 150 seedlings in some cases. Increasing the number to 300 could result in planting excess seedlings, and most planting comes at a high cost when one includes all aspects tied to planting (i.e., gathering cones, extracting and storing seed, sowing seed and caring for seedlings, lifting, packaging and refrigeration of seedlings, shipping to a planting site, planting, and monitoring of planted trees). Expected mortality, form, and vigor are always considered before a silviculturist certifies a stand. The intent is to re-establish a stand to meet future timber production objectives on suitable timberlands except in cases where a harvest objective was other than timber production.

#### TM10 Public Concern: The managing agencies should avoid the use of seed cutting because it is inappropriate for ponderosa pine and mixed conifer stands.

The seed-tree silvicultural system is rarely used on the SJNF and TRFO, and that trend would be expected to continue over the life of this revised LRMP. We do intend to retain this system as a means to meet objectives in the rare occasions where it may be the most effective silvicultural tool. As noted in Silvicultural Systems for the Major Forest Types of the United States (USFS 1983), "[t]he seed tree...method [is] appropriate depending on insect and disease infestations and site and stand conditions." Particularly on moist sites, moderate to severe dwarf-mistletoe infested stands may best be harvested under a seed-tree prescription, taking advantage of the few less infected trees to regenerate a site. This method can also be used in areas of high bark beetle risk.

## TM11 Public Concern: The managing agencies should correct the estimates of demand for timber because reduced demand is directly related to USFS budget constraints and not industry capacity.

As stated in the FEIS, both timber demand and timber industry capacity have decreased, particularly demand for conifer-based products. This trend has been ongoing for many years. Demand for such products could see an increase during the period of this revised LRMP but there is no current compelling evidence for such a trend at this time. USFS budgets do have an impact on timber product offerings, but the history of mill closures over the last two decades, coupled with recent numerous no-bid offerings, provide evidence for the statement above. The severe downturn in the regional and national economy, and its influence on wood product values, has had a profound effect on timber purchaser viability; unfortunately, recovery from this downturn is expected to be slow, further delaying significant increases in timber product demand.

#### TM12 Public Concern: The managing agencies should add forest health to the goals of the LRMP revision to avoid the worst-case scenarios.

Section 2.1 of the revised LRMP establishes an "ecological framework" that sets the stage for management of SJNF and TRFO lands over the life of this LRMP. Though the term "forest health" is not explicitly stated, the ecological framework incorporates key concepts that tie directly to fostering and maintaining sustainability and resilience of the forest environment—or, in other words, ensuring forest health. The desired conditions, objectives, and other key components of the LRMP establish and enforce goals for ensuring forest health.

#### TM13 Public Concern: The managing agencies should revise the language related to timber harvest to eliminate the appearance of bias against active forest management.

We agree that forest health is an important issue. The recent and potential impacts of insects and disease on the forest environment have been bolstered in the FEIS. We believe the FEIS and LRMP better reflect the need to bring this to the attention of forest staff and affected publics, and to provide direction to effectively influence forest health where possible. Also, we have attempted to better disclose the limitations of the SJNF to affect forest health, given that 1) the bulk of the SJNF is without roaded access for treatments requiring motorized equipment (particularly, vehicles) and 2) expansion of wildland fire to serve to positively influence forest health entails substantial challenges.

#### TM14 Public Concern: The managing agencies should use active management, including timber harvest to enhance old growth attributes.

Our standards and guidelines allow "projects that maintain, improve, or restore old growth components or function."

## TM15 Public Concern: The managing agencies should not permit salvage logging within MA 3 following fire, insect outbreaks, or wind events because it is inconsistent with the objectives for the management area.

Salvage logging could only take place outside roadless areas. The bulk of MA 3 is roadless. Note the description indicates that "Roads...are present, although uncommon. Management activities are allowed, but limited." Hence, the majority of MA 3, regardless of disturbance by fire, insects and disease, or wind, would not undergo salvage logging and would reflect the result of natural ecological processes.

Within the limited roaded portions of MA 3, salvage logging could be initiated to provide for public safety along open roads or adjacent private land following mortality-inducing disturbance events (similar to efforts conducted following the Missionary Ridge wildfire of 2002). It might also be used to reduce future fuel loading (say, prior to standing dead falling and adding to ground fuels). There are many such areas adjacent to private lands where this would be appropriate from a WUI standpoint. We believe the scale of such harvesting would not detract from the overall "natural landscapes with limited management" theme of MA 3 lands.

Lastly, from a suitability standpoint, timber "production" would be prohibited in MA 3 lands. The intent is to have salvage harvest, like many tools, as a means to meet other objectives, like the examples above.

- TM16 Public Concern: The managing agencies should not prioritize harvesting trees killed by fire, insects, or wind throw because of the lack of science supporting this priority.
  Removal of dead trees to capture their value and provide forest products to the American people is part of the desired conditions for the timber program. There are good reasons to retain dead trees for wildlife habitat, soils protection, etc.; however, given the very active insect and disease conditions currently, there is generally many more dead trees than are required to meet those needs. We may need to prioritize the removal of trees killed by insects, disease, fire, or wind throw over green trees to utilize them prior to decay. Harvest of dead in lieu of green trees is just good resource conservation given that the dead trees are useable only for a short time and live trees would continue to grow and generate wood fiber. All projects on the SJNF and TRFO need not improve or achieve desired ecological conditions if they meet other desired conditions such as timber production, public safety, fuels treatment etc., and do not create unacceptable environmental costs.
- TM17 Public Concern: The managing agencies should include timber harvest as a tool to achieve the desired condition for spruce-fir and cool-moist mixed conifer and to support the desired condition for aspen.

Although there are large acreages of these timber types on the forest, most are in wilderness or roadless areas. Hence, of the total SJNF and TRFO acres of cool-moist mixed conifer, only about 19% falls in suitable timberlands (that is, roaded, less than 35% slope, and appropriate for ground-based harvesting equipment). Similarly, approximately 15% and 23% fall in suitable timberlands for spruce-fir and aspen, respectively.

We agree that timber harvest should be used as a tool for the management of these timber types. However, it would be difficult to increase harvest levels in the short term while meeting other desired conditions within lands suitable for harvest. Within the roaded portion of these timber types the mix of age classes is much more evenly distributed, limiting the need for harvest, during the life of this LRMP. Roadless portions of the forest have a much higher proportion of mature stands, but fire, or insects and disease, would be the primary agents of change in those areas.

TM18 Public Concern: The managing agencies should reconsider the proposal to harvest 50 acres of spruce-fir forests each year because there is no ecological justification for harvest of this forest type.

We agree that hazardous fuels treatments are rarely needed in the spruce-fir type. There are other objectives expected to be met over this limited scale. For instance, within MA 5 timber production is an objective. Timber harvest may occur within these lands to provide forest products to the American people, as long as it can be accomplished within environmental constraints. For instance we have identified the need to establish young age classes of spruce-fir forests. As a result of fire suppression, these forests have missed the small-scale disturbances that occur with small fires that create openings and opportunities for new regeneration to become established. Uneven-aged management, group selection and single-tree selection have been proposed to both mimic those natural disturbances, and provide forest products. We recognize that most large-scale disturbance would occur due to insects (i.e., spruce beetle) or fires; that is why we have proposed a very small proportion of the spruce-fir stands to be converted to young age classes by timber harvest (50 acres per year out of 498,000 acres of spruce-fir cover type). (The current spruce beetle epidemic, largely falling within and encompassing the eastern two-thirds of the Weminuche wilderness, is resulting in a major shift in development stage within the spruce-fir forest type.)

TM19 Public Concern: The managing agencies should clarify when timber harvest could occur when it is incompatible with desired conditions and objectives.

There are no lands suitable for timber production outside MA 5; however, timber harvest is allowed for purposes other than timber production, such as hazardous fuels reduction, forest restoration, hazard tree removal, or improvement of forest health. Since timber harvest would only occur in these areas for purposes other than timber production, the desired conditions, objectives, and standards and guidelines for other resources apply and would drive projects. In such cases, timber harvest is used as a tool to meet such objectives. Reasons to harvest would be variable and difficult to list. Harvest levels, as displayed in Table 8, under "other lands," could vary widely, depending on a number of factors such as the rate of development at or near the WUI coupled with climate change. Together, these two factors may drive a need for fuels reduction and forest restoration in MA 7 or similar lands. The largest acreage of "other lands" where timber harvest could occur is found in MA 3, which restricts road construction to temporary roads for fuels or restoration treatments. In addition, restrictions on activities within roadless areas would severely limit timber harvest primarily to the proportionally small roaded portions of MA 3. We believe, given the above, that the LRMP and other regulatory direction provide adequate guidance for timber harvesting activities.

#### TM20 Public Concern: The managing agencies should provide the criteria for determining timber harvest suitability to clarify the differences between the alternatives.

The process for determining timber harvest suitability is driven by and clearly identified in the planning regulations and NFMA and was not repeated in this LRMP. The only lands that are suitable for timber production are mapped as MA 5, which varies by alternative. Timber harvest may occur on "other lands" if MA direction allows and the lands are tentatively suitable (biologically capable and administratively available). However, those lands are not considered suitable for timber production and hence, are not included in the calculation of allowable sale quantity (ASQ). There are no roadless lands based on the new inventory included in the LRMP that are mapped as suitable for timber production (MA5). All lands that would have irreversible soil damage occur if timber management treatments are implemented have been removed from suitability and tentative suitability.

#### TM21 Public Concern: The managing agencies should monitor volume sold for timber.

The SJNF and TRFO do track timber sale volumes, as is evident from Figure 3.9.2 in the FEIS. As to the question whether timber sale volume should become a formal monitoring effort, volume sold is not legally required and is, to a great degree, affected by factors beyond the control of SJNF and TRFO decision-makers—primarily industry demand for material coupled with appropriated funding by Congress. Sale volume would always be an important issue, but we do not feel it should become a monitoring requirement due to inability to control the above factors.

#### TM22 Public Concern: The managing agencies should not increase the intensity of aspen harvest.

Information presented in the FEIS points out that demand for aspen products for local industry amounts to about 13 million board feet (MMBF) annually. The projected volume under the Preferred Alternative would provide about 43% of the annual demand. A question that arose at a 2004 aspen workshop was whether the SJNF and TRFO could provide half of that annual demand. Tables 2.2.1 and 2.2.2 in the LRMP reflect a large proportion of mature closed aspen forests, more so than is desired. Hence, increasing aspen harvests over the life of this LRMP would better meet local industry demand and desired conditions for age class distribution.

#### TM23 Public Concern: The managing agencies should increase the projected spruce fir timber harvest acres to achieve a higher proportion of young spruce fir.

The current, ongoing spruce beetle epidemic, while disappointing to many publics given the widespread mortality in Engelmann spruce (and to a lesser extent, blue spruce), is likely serving to help meet desired conditions for expanding acres dominated by the young development stage. The loss of overstory spruce is stimulating growth in understory spruce and fir (i.e., seedlings, saplings, and poles), where established. In addition, young spruce-fir stands are found within the suitable timber base as a result of past harvests. The bulk of mature spruce-fir is found in wilderness and roadless, where active timber management is not allowed.

#### TM24 Public Concern: The managing agencies should acknowledge that timber harvest does not affect streamside vegetation.

Timber harvest can affect streamside vegetation. An example, discussed in the FEIS, could be where road construction or reconstruction occurs across a stream course. In cases where trees need to be removed at the intersection of streamside and road corridors, an impact to that vegetation would result. Given the expected minimal road construction or reconstruction associated with this LRMP, the impacts would be limited. Also, if not properly buffered, timber harvest could have an influence on streamside vegetation, largely through sedimentation from adjacent harvested areas (e.g., from erosion off of skid trails into the streamside corridor). However, little effect to streamside vegetation from timber harvest should result based on the LRMP planning components.

#### TM25 Public Concern: The managing agencies should evaluate the impact of sudden aspen decline on aspen populations.

The SJNF vegetation simulator modeling indicates annual net growth of 14,135 hundred cubic feet in the aspen strata not including aspen treated in the mixed conifer types, which is 141% of the volume needed to sustain the 500-acre figure estimated in the LRMP and includes historical levels of mortality. The long-term effects of sudden aspen decline are yet unknown, but the effects are primarily focused on lower-elevation stands, which do not represent the most productive portion of the aspen suitable base. If significant changes in suitable acres do occur that would make a change in ASQ necessary, the LRMP would need to be amended; however, that does not appear to be necessary at this time. As we continue to apply adaptive management and monitor mortality levels in all species, estimates of acres treated may change. These are only estimates of harvest levels and are affected by many variables.

## TM26 Public Concern: The managing agencies should resolve the contradictions in desired conditions, objectives, standards, and guidelines related to biomass removal during timber harvest and fuel reduction efforts.

All LRMP components regarding biomass removal during timber harvest and fuel reductions have been updated for accuracy and clarification.

#### TM27 Public Concern: The managing agencies should clarify how clearcuts would help develop desired age class diversity.

Age-class diversity is measured at the landscape scale or larger. Aspen grows in even-aged stands. The desired condition is to have even-aged stands of varied ages classes across the landscape rather that most stands of the same age. Clearcuts stimulate regeneration (via suckering) of the youngest age class (seedlings), which then grow up through the various age classes to maturity in approximately 100 years.

#### TM28 Public Concern: The managing agencies should modify the Timber Sale Program Quantity to show annual sale of 6.5 MMBF of aspen.

The FEIS does not recommend or commit the SJNF and TRFO's to meeting 50% of the annual aspen demand. The discussion specific to aspen actually ends with: "Can 50% of the annual aspen demand...be sold off of the SJNF, while operating within the consensus reflected by [agreed-upon parameters surfaced at an aspen workshop in 2004]?" The San Juan growth and yield information determined that, based on assumptions of long-term sustained yield capacity, the SJNF and TRFO can consistently produce 500 acres of aspen harvest, or approximately 5.65 MMBF. The estimated volume would provide about 43% of the annual 13 MMBF demand, while meeting other SJNF and TRFO desired conditions, objectives, standards, and guidelines.

#### 4.31 Terrestrial Wildlife

TW1 Public Concern: The managing agencies must make use of all the best available scientific information in regard to elk and mule deer to account for more recent and accurate data on the population objectives for those species including information on impacts on elk and mule deer from roads, traffic, and oil and gas development.

The LRMP and FEIS have been updated with the best available scientific information in regard to elk and mule deer. Please refer to the Terrestrial Wildlife section of these documents.

- TW2 Public Concern: The managing agencies should revise the assumptions related to big game herd populations because winter range is the limiting factor and it is shrinking. The assumptions related to big game herd populations have been updated for accuracy and clarification. Winter range is identified as an increasingly important factor for big game and is considered to the extent applicable within the analysis of impacts on big game.
- TW3 Public Concern: The managing agencies should support conservation of adjacent private lands and assist landowners in receiving compensation from CPW for losses attributable to big game.

Reimbursements to private landowners for game damage are beyond the scope of USFS and BLM authorities. CPW does have a game damage program to reimburse landowners for game damage if program criteria are met. The agencies coordinate with CPW on projects occurring on federal lands that support the state effort and concerns for private land impacts. These cooperative projects, involving many partners, are designed to improve winter range habitat on public lands with the intention of helping to reduce big game dependence on private agricultural lands. The condition of thousands of acres of winter range is being improved over the planning area under this cooperative effort.

- TW4 Public Concern: The managing agencies should not provide habitat for elk above the population objectives to allow for other resource programs and objectives.
  Desired conditions regarding elk have been rewritten for accuracy and clarification. Desired conditions in the LRMP are such that habitat on SJNF and TRFO are not the limiting factor in meeting CPW population objectives. Elk populations are currently within the long-term state population objectives outlined for the three elk herds within the SJNF and TRFO. Elk are considered generalists and utilize a variety of habitats that also support a variety of agency multiple use objectives including timber uses. Traditionally, populations of wildlife species are managed by the state through use of tools such as harvest through hunting.
- Public Concern: The managing agencies should include language to adopt the Canada lynx conservation measures provided by the Southern Rockies Lynx Amendment.
  The Southern Rockies Lynx Amendment has been finalized since the publication of the Draft LRMP. It has been adopted as direction for this LRMP revision. The Terrestrial Wildlife section of the LRMP and FEIS has been updated for accuracy and clarification.
- TW6 Public Concern: The managing agencies should revise Desired Condition 10.4 to refer to Canada lynx habitat and not populations to be consistent with the other desired conditions.

Desired conditions for Canada Lynx have been removed and replaced by Desired Condition 2.3.1 that addresses habitat and population linkages.

TW7 Public Concern: The managing agencies should publish a map of proposed Canada lynx habitat for review and comment prior to release of the FEIS to ensure that effects are accurately analyzed and disclosed.

The Southern Rockies Lynx Amendment has been completed since the Draft LRMP was published and has been adopted as direction for the LRMP revision. This amendment, which included habitat definitions, was open to public review and comment during that development process. Mapping lynx habitat was an administrative process that utilized the current definition of habitat outlined in the amendment and adjustments for local conditions. This was done as a coordinated effort between adjacent USFS units and agency specialists for the landscapes that share a similar ecological condition in southwest Colorado along with close coordination with the USFS, CPW, and other managing agency units involved in the remapping efforts. The maps are available to the public on request.

TW8 Public Concern: The managing agencies should identify all lynx habitat linkage areas and provide for their long-term maintenance.

Landscape linkage areas on the SJNF and TRFO and LRMP components related to them (which provide for their long-term protection) are described in the Terrestrial Wildlife sections of the LRMP and FEIS.

- TW9 Public Concern: The managing agencies should incorporate standards and guidelines to protect wild sheep populations from disease transmission from domestic sheep.
   Appropriate LRMP-level standards and guidelines are incorporated to address disease transmission from domestic sheep and goats to wild bighorn populations.
- TW10 Public Concern: The managing agencies should discontinue the policy of eliminating sheep grazing on existing allotments because science does not yet support a connection between domestic sheep and bighorn sheep population declines.

The LRMP sets overall guidance through standards and guidelines concerning bighorn sheep and domestic livestock. This guidance is implemented at subsequent stages of planning through a variety of proposed management activities designed to achieve overall LRMP direction. The agencies do not have a policy of eliminating sheep grazing on existing allotments. Decisions concerning individual allotment management and status are made through the administrative and/or NEPA process at the "project level" and, as such, are beyond the scope of decisions being made within this LRMP revision.

TW11 Public Concern: The managing agencies should acknowledge that extensive stands of sagebrush are required for sage-grouse populations to persist.

An analysis of existing conditions of sage-grouse habitat is contained in the FEIS. The impacts of the alternatives in the LRMP to sage-grouse and sage-grouse habitat are disclosed in the FEIS.

TW12 Public Concern: The managing agencies should revise the desired conditions for Gunnison sage-grouse because they are unduly restrictive.

Desired conditions for terrestrial wildlife have been rewritten, and there are no desired conditions specific for Gunnison sage-grouse. However, desired conditions that address habitat conditions for special status species would apply to Gunnison sage-grouse.

TW13 Public Concern: The managing agencies should add objectives to address management of Gunnison sage-grouse.

An objective was added to address Gunnison sage-grouse habitat.

TW14 Public Concern: The managing agencies should add objectives and desired conditions aimed at restoring and maintaining viable populations of Gunnison sage-grouse to avoid contributing to the need to list the species under the ESA.

Desired conditions for special status species would apply to Gunnison sage-grouse and Gunnison sage-grouse habitat. An objective was added to address Gunnison sage-grouse habitat.

TW15 Public Concern: The managing agencies should manage lands for the protection of Gunnison's prairie dogs because the montane portions of their range contain populations that are eligible for listing under the ESA.

Consultation with the USFWS indicates that all populations of Gunnison's prairie dog occurring across SJNF and TRFO are still considered as the prairie population and not the montane population. The prairie species is a BLM and USFS sensitive species and is considered and managed, as such, under each agency's guidance for the sensitive species program.

TW16 Public Concern: The managing agencies should revise the discussion of the impacts of roads on raptors to allow for variances when birds have adapted to routine human disturbance.

The FEIS has been updated to address raptor habitation to increased activity. Refer to the section titled Wildlife Issues Related to Migratory Birds.

#### TW17 Public Concern: The managing agencies should include nesting conservation measures that are specific to bald eagles.

Conservation measures have been developed that are specific to various raptor species. Bald eagles have conservation measures that are specific to bald eagle biology.

## TW18 Public Concern: The managing agencies should remove references to MIS from the LRMP because current planning rules eliminate this requirement and to clarify that this requirement would not apply to BLM lands and to comply with current planning rules and court rulings.

The LRMP is written under the provisions of the 1982 Planning Rule. As such, MIS are a required component of the planning process. MIS apply to NFS lands (as required by 36 CFR 219); they do not apply to BLM lands.

#### TW19 Public Concern: The managing agencies should revise the design criteria for marten because they would prevent management of spruce-fir forests.

Design criteria for marten and other MIS have been removed from the LRMP as applying these standards and guidelines to MIS is not compatible with the purpose of using these species to monitor change from management activity.

#### TW20 Public Concern: The managing agencies should revise Objective I.8 because logging would harm habitat for marten.

The objective for pine marten has been re-written to address management actions to improve marten habitat.

## TW21 Public Concern: The managing agencies should revise or delete Objective I.1 because it provides no useful guidance because it is vague and provides insufficient concrete guidance.

Objective I.1 was replaced by Objective 2.3.24. The intent of the objective remains unchanged. This objective did not identify specific species to improve habitat in order to provide flexibility and allow for project to improve habitat for species not addressed in other objectives.

#### TW22 Public Concern: The managing agencies should revise Objective I.5 to clarify what constitutes improvement of Abert's squirrel habitat.

The objective for Abert's squirrel habitat references the Abert's squirrel species assessment for SJNF. Habitat requirements are identified in the species assessment.

## TW23 Public Concern: The managing agencies should revise or delete Objective I.7 because it would not likely benefit mountain bluebird and it would not reduce sudden aspen decline. The objective for mountain bluebird has been deleted.

#### TW24 Public Concern: The managing agencies should revise the design criteria for Abert's squirrel because they are conflicting and unclear.

Design criteria for Abert's squirrel and other MIS have been removed from the LRMP as applying these standards and guidelines to MIS is not compatible with the purpose of using these species to monitor change from management activity.

#### TW25 Public Concern: The managing agencies should revise the MIS objective for mule deer and elk because they are too conservative.

There are no MIS objectives for mule deer. The MIS objective for elk calls for improvement of 5,000 acres over the life of the LRMP, which would constitute significant habitat improvement. Objectives are partially based on what agencies feel they can accomplish based on current workload, budget, and personnel.

TW26 Public Concern: The managing agencies should include MIS monitoring including use of CPW data and clarification of the use of habitat to gauge population health and to ensure adequate protection of ecosystems and species.

The management of MIS applies only to NFS lands as required by the 1982 Planning Regulations at 36 CFR 219; it does not apply to BLM lands. MIS serve several related functions in LRMP development and implementation. MIS are intended as a tool to establish explicit objectives for wildlife and fish habitat, analyze the degree to which alternatives meet those objectives, and monitor the effects of implementation. Changes in MIS populations or their habitats may indicate that current management is affecting the composition, structure, or function of those habitats, resulting in LRMP direction not being met, and need for changes in management direction. The SJNF would use data from CPW and other sources to inform MIS analysis and trends.

TW27 Public Concern: The SJNF should increase the numbers of MIS to fully address potential management activities to ensure there are indicators for most proposed management activities and major vegetation types, and because the proposed list is inadequate to cover the range of conditions and ecosystems that should be monitored.

The LRMP includes an adequate number of MIS species to monitor the SJNF major management issues and challenges. MIS serve several related functions in LRMP development and implementation. MIS are intended as a tool to establish explicit objectives for wildlife and fish habitat, analyze the degree to which alternatives meet those objectives, and monitor the effects of implementation.

TW28 Public Concern: The SJNF should include a MIS for mountain grasslands to monitor for impacts from grazing.

The LRMP includes an adequate number of MIS species to monitor the SJNF major management issues and challenges. Impacts from grazing are monitored with different approaches, including project-level analysis.

TW29 Public Concern: The SJNF should reconsider the identified MIS to ensure that the best indicator species have been selected.

The SJNF utilized the five principals for use in selection of MIS as identified in "Region 2 Management Indicator Species Selection Process and Criteria" by Hayward, G.D., N.M. Warren, B. Parrish, M. Williams, C. Liggett, and V. Starostka (2004). The LRMP includes an adequate number of MIS species and those that are most effective for monitor the SJNF major management issues and challenges.

- TW30 Public Concern: The SJNF should describe suitable or optimal habitat for each MIS. Habitat models have been developed for the terrestrial MIS wildlife species. The Draft EIS describes habitat characteristics for these MIS on pages 3.163 through 3.166, and this information is also included in the FEIS. A more detailed discussion, which includes suitable and optimal habitat, is found in the project record for the MIS assessments. This is available for review upon request.
- TW31 Public Concern: The managing agencies should add a discussion of the potential for snowmobiles to cause snow compaction and the consequences for coyotes.
  The Southern Rockies Lynx Amendment recognizes that snow compaction may affect individual lynx. The amendment provides for the flexibility to evaluate and accommodate where research indicates there would be no harm to lynx. The Southern Rockies Lynx Amendment was in draft form at the time of the Draft LRMP publication. The LRMP has been updated to include Southern Rockies Lynx Amendment direction and research considerations concerning snow compaction.
- TW32 Public Concern: The managing agencies should revise the timing limitations to place greater limitation on direct and indirect losses of big game winter range and should include production and reclamation in restricted activities.

Timing limitations for big game winter range and parturition only restrict construction and drilling and were developed in coordination with CPW. Production and maintenance may continue

during the critical dates. Standards and guidelines, desired conditions, and objectives provide guidance for project and activity decision making in order to protect resources such as wildlife and their habitat, during and after development.

TW33 Public Concern: The managing agencies should adequately define "threshold levels of concern" and remove the inaccurate term "unregulation oil and gas development" in the direct and indirect impacts section for wildlife.

The direct and indirect impacts to wildlife from oil and gas development have been revised for accuracy and clarification. Please refer to the Terrestrial Wildlife section of the FEIS.

TW34 Public Concern: The managing agencies should restrict development or apply NSO stipulations in critical elk and mule deer habitat.

The managing agencies have coordinated with CPW in the identification of important habitat and effective guidance for elk and mule deer on public lands. Stipulations, standards and guidelines, objectives, and desired conditions have been written to protect critical elk and mule deer habitat during development.

TW35 Public Concern: The managing agencies should remove the 4-mile NSO restriction around Gunnison sage-Grouse lek sites and revise stipulations to be consistent with the Gunnison sage-Grouse Rangewide Conservation Plan.

The Supplement to the Draft EIS and leasing stipulations do not include an NSO at a 4-mile buffer around leks. There is a timing limitation at a 4-mile buffer around leks and a NSO at a much smaller buffer distance of 0.6 mile contained in the CSU stipulation. The 0.6-mile NSO buffer is consistent with the Gunnison Sage-grouse Rangewide Management Plan.

TW36 Public Concern: The managing agencies should clarify which maintenance activities would be impacted by timing limitations for wildlife.

Timing limitations for wildlife have been revised for clarification.

TW37 Public Concern: The managing agencies should include mitigation measures in addition to season/timing limitations for wildlife.

The LRMP includes mitigation measures for the protection of wildlife beyond those associated with timing limitations; additional mitigation measures may be addressed during subsequent project level analysis.

TW38 Public Concern: The managing agencies should develop specific standards and guidelines to protect wildlife in the GSGP area.

Additional standards, guidelines, and leasing stipulations have been developed to address wildlife concerns in areas where development may occur (including the GSGP). Please refer to the Terrestrial Wildlife section of the Final LRMP and Appendix H.

TW39 Public Concern: The managing agencies should perform a more thorough evaluation of the impacts to wildlife from existing leases in the GSGP.

The impact analysis have been revised and impacts to wildlife from existing leases and future leasing, based on the RFD scenario, are analyzed by alternative.

TW40 Public Concern: The managing agencies should include a discussion of potential impacts of development in the GSGP on Columbian sharp-tail grouse and address noise impacts to both Columbian sharp-tailed grouse and the Gunnison sage-grouse.

Impacts to Gunnison sage-grouse are addressed in the Terrestrial Wildlife section of the FEIS. Impacts to sharp-tailed grouse are address in Appendix T.

TW41 Public Concern: The managing agencies should included additional limitations on noise and the density of surface facilities to support existing population levels of all terrestrial wildlife in the GSGP.

Additional standards, guidelines, and leasing stipulations have been developed to address potential effects to terrestrial wildlife species (including noise-related direction). Guidelines have been developed specific for Gunnison sage-grouse to address noise (2.3.71) and density of facilities (2.3.72). Please refer to the Terrestrial Wildlife section of the LRMP and Appendix H.

TW42 Public Concern: The managing agencies should explain how cattle grazing has a positive impact on elk winter range.

The FEIS addresses beneficial effects associated with livestock grazing including improvement in plant vigor that increases forage quantity and quality for herbivorous and omnivorous mammals.

TW43 Public Concern: The managing agencies should remove the Miller et al. 1996 reference on page 3.153 of the Draft EIS because it is inconsistent with the cited research.

The EEIS has been undated with references that use the best available science. The reference

The FEIS has been updated with references that use the best available science. The reference cited by the commenter has been removed in this context.

- TW44 Public Concern: The managing agencies should remove the section titled "Landscape Connectivity" because it is not within the scope of the SJNF and TRFO LRMP.

  Landscape connectivity is very much within the scope of the LRMP since lynx, which is a wideranging threatened species that occurs on SJNF and TRFO, needs access to multiple landscapes and landscape connectivity to facilitate its need for food, mates, and genetic interchange.
- TW45 Mule deer migration corridors should be designated within MA 2 and should contain a standard that all projects, activities, and infrastructure would be designed, timed, and located to ensure continued successful migration of mule deer.

The LRMP contains standards and guidelines that address wildlife corridor protection, as well as oil and gas leasing stipulations that take movement corridors into consideration. Including all corridors within MA 2 would not be the appropriate tool to protect these areas because movement corridors are dynamic and should be recognized across all the various MAs.

#### 4.32 Water

WA1 Public Concern: The managing agencies should consider additional application of NSO lease stipulations for wells in all watersheds (with the possible exception of Disappointment Valley) in the Final LRMP/FEIS.

The LRMP has been revised to include new stipulations and standards and guidelines protective of groundwater across the planning area. Please refer to the Water section of the LRMP and Appendix H.

WA2 Public Concern: The managing agencies should include more information on efforts to reduce or minimize pollutant loads and restore support for designated beneficial uses for the impaired waters and specify whether the proposed activities are consistent with pollutant load allocations or water quality targets established in total maximum daily loads.

Objectives regarding water have been rewritten for clarification and accuracy, including an objective for waters not meeting the state's beneficial uses. Please refer to the Water section of the LRMP.

WA3 Public Concern: The managing agencies should more fully explain whether and/or how each of the proposed actions would contribute to the dewatering of the Fruitland Formation.

Dewatering of the Fruitland Formation has been addressed in greater detail in the FEIS. Please refer to the Environmental Consequences of the Water section in the FEIS.

WA4 Public Concern: The managing agencies should create a watershed restoration objective for the Hermosa Creek headwaters to enhance watershed function and integrity.

Objectives regarding water and watershed restoration have been rewritten for accuracy and clarification. Please refer to the Water section of the LRMP.

WA5 Public Concern: The managing agencies should include information regarding discharge into navigable waters and the applicability of Section 401 of the Clean Water Act to permitting and licensing activities in the planning area.

The LRMP should not repeat laws, regulations, and policies if at all possible. Applicable laws and regulations are summarized in Additional Referenced Guidance in the Water section of the LRMP.

WA6 Public Concern: The managing agencies should include information in the Final RMP/FEIS regarding how the rest of the water is disposed of, and information regarding disposal of produced water from any future CBM development in the planning area.

The LRMP has been revised to include new stipulations and standards and guidelines addressing the recycling and disposal of water in association with oil and gas activities across the planning area. The FEIS Environmental Consequences Water section also discusses water disposal in conjunction with oil and gas activities. Please refer to the Water section of the LRMP, FEIS, and Appendix H.

WA7 Public Concern: The managing agencies should incorporate specific mitigation measures from guidance documents into the sections of Chapter 3 Volume 1 above, in the Design Criteria section, or as an Appendix.

The design criteria in the LRMP include mitigation measures in the form of standard and guidelines and in the additional referenced guidance. We do not specifically list the mitigation measures from the additional referenced guidance documents because there are many mitigation measures that apply to different areas and different circumstances and because better methods may be identified in the future.

WA8 Public Concern: The managing agencies should include a standard and/or objective in the Design Criteria (Volume 2) for waters not meeting the state's beneficial uses under existing conditions.

Objectives regarding water have been rewritten for clarification and accuracy, including an objective for waters not meeting the state's beneficial uses. Please refer to the Water section of the LRMP.

- WA9 Public Concern: The managing agencies should state that any discharges of dredged or fill material associated with individual permits or leases may require a Clean Water Act 404 permit, which would include an additional full alternatives and impacts analysis.

  The LRMP does not repeat laws, regulations, and policies if at all possible. Applicable laws and
  - regulations are summarized in Additional Referenced Guidance in the Water Section of the LRMP.
- WA10 Public Concern: The managing agencies should include information regarding regulation pursuant to the Safe Drinking Water Act, including information and regulation of public water supplies for communities within the planning area.

The LRMP should not repeat laws, regulations, and policies if at all possible. Applicable laws and regulations are summarized in Additional Referenced Guidance in the Water section of the LRMP.

- WA11 Intentionally left blank.
- WA12 Public Concern: The managing agencies should include monitoring in the desired conditions for water quality and quantity.

Monitoring would be addressed in the monitoring and evaluation section of the LRMP and has been addressed in other NEPA decisions for the HD Mountains (e.g. NSJB EIS, 2006). Water

quality and quantity monitoring is a high priority for the SJNF and TRFO in the HD Mountains due to the produced water issues associated with CBM gas production and other activities. Monitoring is also a priority because the SJNF and TRFO must protect its vested water rights for the springs, seeps, and reservoirs. If monitoring shows impacts to surface and ground water resources where federal water rights are affected, and the impacts are related to CBM gas production, augmentation plans through the Colorado Water Court would be required. The SJNF and TRFO, in cooperation with the COGCC and others, have already started long-term monitoring of surface water and groundwater in the HD Mountains.

WA13 Public Concern: The managing agencies should revise the desired condition related to groundwater to ensure that valid existing rights are not negatively impacted.

Ground water protection is addressed as a standard in the LRMP. FLPMA (43 USC 1752) states, "Terms and conditions must minimize damage to scenic and aesthetic values and fish and wildlife habitat and otherwise protect the environment" (Sec. 302, 504, 505).

WA14 Public Concern: The managing agencies should clarify whether further development could be prohibited by Desired Condition 3.13.

Desired conditions regarding water have been rewritten for clarification and accuracy. Please see the desired conditions in the Water section of the LRMP.

WA15 Public Concern: The managing agencies should clarify Desired Condition 3.15 and its impact on existing diversions.

Desired conditions regarding water have been rewritten for clarification and accuracy. Please see the desired conditions in the Water section of the LRMP.

WA16 Public Concern: The managing agencies should clarify Desired Condition 46.10 to ensure that water quality would meet or exceed attainable state standards to ensure the document is not used in legal actions or against future mining activities.

The desired conditions regarding for water quality have been rewritten for accuracy and clarification. Please refer to the Water section of the LRMP.

WA17 Public Concern: The managing agencies should acknowledge the apparent conflict between proposed water rights objectives and regional direction.

This comment does not cite the correct USFS policy and direction regarding water rights policy. National USFS policy can be found at Forest Service Manual (FSM) 2500 Chapter 2540 Water Uses and Development. The portions of the LRMP cited are in compliance with USFS policy and regulations.

WA18 Public Concern: The managing agencies should include a comprehensive table of waterrelated LRMP items to make the LRMP clear and easy to understand.

The LRMP is organized in such a manner that water-related items are now much easier to locate (Sections 2.1, 2.4, 2.5, and 2.6). In addition, we have included a crosswalk to LRMP components related to aquatic population viability (see Appendix Q).

WA19 Public Concern: The managing agencies should reference USFS regulations regarding areas managed for municipal water supplies to clarify when NFS lands are managed for municipal water supplies.

Citation of regulatory authority for municipal water supplies can be found in the Additional Referenced Guidance in the Water Section of the LRMP. In addition, new desired condition statements have been added regarding municipal watersheds and several new stipulations address this issue.

WA20 Public Concern: The managing agencies should recognize their responsibility to facilitate water development to comply with the Organic Administration Act and court rulings.
Interpretations of existing law, regulation, and policy may differ. Resolution of these issues is outside the scope of the LRMP.

WA21 Public Concern: The managing agencies should revise direction related to instream flow and future water development to comply with state law.

The LRMP direction related to instream flows and future water developments is intended to be responsive to federal laws, policies, and regulations. Depending on the nature of the proposed federal action, state law may or may not be applicable.

WA22 Public Concern: The managing agencies should ensure that project-specific requirements to protect water quality are implemented and enforced to protect tribal water resources.

The SJNF and TRFO actively participates in watershed organizations for the Dolores River, Mancos River, Lightner Creek, Hermosa Creek, Pine River, and many other groups. It is anticipated SJNF and TRFO participation in watershed groups would continue into the future. The concept of cooperation with individuals and groups interested in water issues is also discussed in the Water Strategy section of the LRMP.

WA23 Public Concern: The managing agencies should add BMPs to the discussion of sedimentation to reduce sediment transfer to water.

BMPs are cited under Additional Referenced Guidance in the Water section of the LRMP. Specifically, many standard BMPs and other design criteria for the protection of water quality can be found at Region 2 FSH 2509.25-2006-1, the USDI/USDA Gold Book BLM/WO/ST-06/021+3071/rev 07, and others.

WA24 Public Concern: The managing agencies should clarify that the water rights would be used beneficially.

Desired conditions and objectives for water specifically state they apply to water rights owned by the SJNF and TRFO. Livestock watering rights could be obtained by the SJNF and TRFO for livestock owned by the SJNF and TRFO or under permit. Please refer to the Water section of the LRMP.

WA25 Public Concern: The managing agencies should revise direction related to water rights to comply with the guidance in the Watershed Conservation Practices Handbook.
 National USFS policy for water rights can be found at FSM 2500 Chapter 2540 Water Uses and Development. The portions of the LRMP cited are in compliance with USFS policy and

Development. The portions of the LRMP cited are in compliance with USFS policy and regulations. The legal authority and direction to monitor, manage and administer special uses on NFS lands, including those project pertaining to water uses and development, and including the requirement to assert terms and conditions can be found at 36 CFR 251, Sec. 50 Subpart B. The use of the FSH 2509.25 is used for watershed conservation practices.

- WA26 Public Concern: The managing agencies should revise the description of the Organic Act as it relates to watershed management to provide an accurate representation of the intention of the act.
  - References to the Organic Act have been deleted and would not be included in the FEIS.
- WA27 Public Concern: The managing agencies should clearly define "reference conditions" and how they are related to the HRV to be consistent with the White River Review Decision.
   Reference conditions and their relationship to the HRV and sustainable ecosystems on SJNF and TRFO are more clearly described in the Final LRMP in the Historic Range of Variability section.
- WA28 Public Concern: The managing agencies should revise the water management provisions to ensure they comply with the Four Cornerstones policy.

The White River Discretionary Review (and Four Cornerstones Policy) does not apply to the SJNF or TRFO. Please see the Water Strategy section of the LRMP where the MOU between the state of Colorado and the USFS and BLM is cited.

WA29 Intentionally left blank.

#### WA30 Public Concern: The managing agencies should clarify that groundwater rights belong to the State of Colorado to comply with the USDA Technical Guide.

In the case of non-tributary groundwater, the state does not own the groundwater; the surface landowner is the owner of non-tributary groundwater. This fact is recognized under Colorado Revised Statute 37-90-137(4), which governs permits to withdraw groundwater from non-tributary aquifers. Section (4)(b)(II)reads as follows: Subject to the provisions of subsections (1) and (2) of this section, the amount of such groundwater available for withdrawal shall be that quantity of water; exclusive of artificial recharge, underlying the land owned by the applicant or underlying the land owned by another: (A) who has consented in writing to the applicant's withdrawal. In the case of tributary groundwater, the state does have jurisdiction over water rights. The SJNF and TRFO is mandated to manage all water resources, including groundwater through FLPMA (43 USC 1752), which requires that "public lands would be managed in a manner that would protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource and archaeological values" (Sec. 102). The SJNF and TRFO have authority to manage ground water on USFS and BLM lands.

#### WA31 Public Concern: The managing agencies should define "favorable conditions of flow" to be consistent with court precedents and state law.

Desired conditions address the concepts of both good water quality and adequate water quantity to support multiple use management as directed in the Multiple Use Sustained Yield Act of1960 (16 USC 528), and the NMFA: "Forest programs must protect and/or improve the quality of soil and water." and "Fish habitat must maintain viable populations of existing native and desired nonnative vertebrate species." (36 CFR 219.19) and FLPMA (43 USC 1752), which requires that "public lands would be managed in a manner that would protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource and archaeological values" (Sec. 102). The SJNF and TRFO have authority to manage for both water quantity and water quality USFS and BLM lands. Desired conditions are overarching "goal" statement. As such, quantification is unnecessary.

- WA32 Public Concern: The managing agencies should clarify the extent to which requirements for instream flow to enhance aquatic ecosystems would affect domestic water providers. The LRMP's desired conditions, objectives, and standards address the necessity of instream flows to support aquatic ecosystems. Details about how much flow, and the environmental and socioeconomic impacts would be analyzed at the site-specific project level. The water suitability section discusses which management areas could allow water development.
- WA33 Public Concern: The managing agencies should revise the discussion of water diversions because the agencies have no authority to limit water development.
  The USFS and BLM disagree. FLPMA (43 USC 1752) states, "Terms and conditions must minimize damage to scenic and aesthetic values and fish and wildlife habitat and otherwise protect the environment" (Sec. 302, 504, 505).
- WA34 Public Concern: The managing agencies should clarify that the production impacts associated with conventional natural gas development are not the same as those associated with CBM natural gas development.

This issue is analyzed and disclosed in more detail in the Water section of the FEIS. It is acknowledged that large volumes of produced water are most common with CBM gas production primarily in the San Juan Basin.

#### WA35 Public Concern: The managing agencies should clarify the limits of their authority over water quality under the Clean Water Act.

States are responsible, with oversight from the EPA, for setting state water quality standards. Per Section 313 of the Clean Water Act, the USFS must comply with these state standards in the same manner and to the same extent as a nongovernmental entity. Therefore, the USFS or BLM cannot authorize activities on the SJNF and TRFO that do not comply with State Water Quality Standards.

#### WA36 Public Concern: The managing agencies should provide evidence that roads significantly affect sediment loading.

Studies cited in the FEIS show that roads are widely recognized as a significant contributor of sediment to streams, especially in forested watersheds. In particular, streams of the Dolores Ranger District were put on the State of Colorado 303.d list for water quality impairment as a result of sediment delivery to the stream. The primary source of sediment leading to the 303(d) listing was the extensive road network. This case in point can be found at http://www.epa.gov/waters/tmdldocs/10003.pdf

#### WA37 Public Concern: The managing agencies should protect the Dolores River and associated watersheds.

The LRMP designates the Dolores River Canyon as a special area with special protection and management to protect the ecological, water related, recreation, and scenic values of the river corridor. The LRMP also shows that 128.77 miles of the Dolores River and certain tributaries are Suitable for inclusion in the Wild and Scenic Rivers System. The SJNF and TRFO would be required to manage the suitable river miles using interim protective management. The FEIS Water - Environmental Consequences section discusses the potential impacts to water quality and water quantity from future activities of oil and gas leasing and development, grazing, travel management, and other activities that might affect the lower Dolores watershed.

#### WA38 Public Concern: The managing agencies should clarify how the rate of overbank flows was determined.

"The best approximation is obtained by constructing a frequency curve, reading the discharge having a recurrence interval of 1.5 years in the annual flood series, obtaining a corresponding gage height from the rating curve, and checking the height against field observations," from Data on the Frequency of Bankfull Discharge, Dunne, T. and L. Leopold, 1978. Water in Environmental Planning. W.H. Freeman and Co., New York, pp. 610–613.

#### WA39 Public Concern: The managing agencies should not file a statement of opposition to a water right unless one of the agencies owns a potentially affected water right.

The SJNF and TRFO policy regarding statements of opposition is within the authority of the SJNF and TRFO and follows Washington direction. USFS Manual 2500, Chap. 2540, Subpart 2541.31 "Notify states of instream flow needs by: (a) filing protests of application for water rights if the exercise of such water rights would adversely affect National Forest resources or water rights of the United States". In addition, by participating within the state water rights appropriation system, the SJNF and TRFO is merely attempting to address water rights issues in a forum advocated by water users and the State of Colorado. By participating in the Colorado water rights system, the SJNF and TRFO is working within an established framework and shows respect for the state's authority to allocate water. The rules, regulations, policy and laws which may relate to water use issues on federal lands, which the SJNF and TRFO must also comply, include but are not limited to FLPMA, ESA, Clean Water Act, 36 CFR 251.50.

#### WA40 Public Concern: The managing agencies should establish a standard setback distance from stream and river corridors and lake shores for timber production.

The FSH 2509.25 establishes management measures to protect the "water influence zone," which includes the geomorphic floodplain, riparian ecosystem, and inner gorge. These areas are to be managed to the benefit of the riparian, wetland, and aquatic community. The SJNF and TRFO must comply with FSH 2509.25.

#### WA41 Public Concern: The managing agencies should not acquire water rights for livestock or irrigation.

The federal government does own land on which irrigation and grazing occurs for federal purposes, for example, at guard stations and work stations where federally owned livestock are grazed. Water rights are acquired through the state appropriative system. FSM 2500, Chapter 2540, Section 2541.35 directs the SJNF and TRFO to "[c]learly inform the permittee that the

authorization does not confer any legal right to the use of water, nor does it provide a basis for acquiring such a right against the United States" (also FSM 2782 and 2783.12).

#### WA42 Public Concern: The managing agencies should verify the figures related to water production from CBM wells.

The figures related to water production from CBM wells have been updated for clarification and accuracy. Please refer to the Water section of the FEIS.

# WA43 Public Concern: The managing agencies should acknowledge that obliteration of roads is not needed to reduce sediment delivery because simple abandonment is sufficient. Simple abandonment of roads that have active erosion and high potential of sediment delivery to waterways are high priority for stabilization. Prior to any road stabilization measures, the SJNF and TRFO would survey the road and design management measures necessary to eliminate or reduce sediment delivery to streams and water-dependent ecosystems. This may involve obliteration, spot rehabilitation, closure, maintenance, or many other sediment reducing options.

#### WA44 Public Concern: The managing agencies should verify accuracy of Table 3.3.3 and Table I-1 to ensure data is consistent.

The tables are displaying similar but different data. In Table 3.3.3 the value displayed is road density, while in Table I-1 the parameter displayed is anthropogenic disturbance, for which road density is 1 out of 6 contributing factors. This means that watersheds that have many miles of roads, but little other disturbance, might not rank highly in terms of anthropogenic disturbance. Additionally, the methodology for the calculation of road density is slightly different for each table, so some minor variations can occur.

## WA45 Public Concern: The managing agencies should ensure that the LRMP would not supplant state water law with respect to the allocation and development of the state's water resources to be consistent with assurances provided by the Undersecretary of Agriculture.

The LRMP appropriately recognizes state authority in the management of water rights while recognizing the need to manage water use on the SJNF and TRFO in order to meet terrestrial, aquatic, and/or other resource management desired conditions and objectives in a manner that minimizes potential negative impacts to the environment.

#### WA46 Public Concern: The managing agencies should correct the discussion of dewatering to be consistent with the NSJB EIS.

The commenter's reliance solely on the Cox report fails to reflect a large body of data/modeling that shows that portions of the NSJB could be hydrologically connected, in areas, to surface water sources. (e.g., Norwest Modeling Report). The purpose of environmental impacts analysis is to disclose the potential impacts of proposed developments; the language used "which may," "may lead to," reflects a level of uncertainty exists and must consequently be discussed. Additionally, 0.07% depletion reflects a large absolute volume of real water, especially in basins that are over appropriated. Exact consistency with the NSJB EIS would require ignoring new, presumably more accurate information that has come to light since the signing of the NSJB EIS.

The commenter is correct that the Colorado Division of Water Resources administers water rights in the state of Colorado. However, the environmental impacts associated with development are the purview of the USFS, not the state of Colorado. Indeed the Colorado Division of Water Resources modeling efforts show that in areas that are proposed for development in the NSJB, groundwater is deemed to be tributary (i.e., hydrologically connected to surface waters). The commenter's assertion that depletions would be minimal and can therefore be dismissed is misguided, given that any water depletion in over appropriated basins is of concern, and any water depletion has the potential to impact ecosystems.

WA47 Public Concern: The managing agencies should strengthen the standards for protection of water resources, aquatic ecosystems, and aquatic species to comply with the 1982 Planning Rule.

LRMP components for water, aquatic ecosystems and aquatic species have been updated and revised. Please refer to these sections of the Final LRMP.

WA48 Public Concern: The managing agencies should revise the discussion of purchasing water for drilling to include the use of treated produced water from public lands.

The sentence discussing the purchase of water for drilling was been revised. Please refer to the Water section of the FEIS.

- WA49 Public Concern: The managing agencies should revise analysis of the impacts from groundwater withdrawals, produced water impacts, surface water stream withdrawals and reductions, and reservoir draw-downs during oil and gas development it is inadequate.
  The oil and gas decision made for the LRMP revision is identifying lands available for lease and what stipulations (i.e., mitigation measures) apply to the lands that are available for lease. This is the first of three stages of analysis for oil and gas development. At subsequent analysis stages (i.e., Stage 3--Application for Permit to Drill or Field Development), specific project proposal(s) would be analyzed. At the LRMP revision analysis stage, the analysis is based on assumptions about how the field might develop if the lands identified for lease are subsequently leased and developed. Since there are currently no specific project proposals this analysis does not identify sources of water for use in gas exploration or production, beyond that fact that diversion and/or development of new water sources for gas exploration and development would be prohibited on federal lands.
- WA50 Public Concern: The managing agencies should remove all references to TEDX in the Water section of the EIS because it has failed to prove a link between chemical exposure to groundwater and materials during fracturing operations.

The provided attachment (QEPA report dated January 2008) critiques a document that was not referenced. The Colburn et al. 2010 reference was published in a peer-reviewed journal, and as such was subject to extensive third-party review by experts in the field and is a more valid tool for informing management decisions than either the QEPA report, or the 2007 TEDX report (neither of which appears to have been subjected to a peer-review process). After reading the 2007 TEDX report, the QEPA January 2008 report, and the 2010 Colburn et al. journal article, the assertion that the 2010 Colburn article is similar to the 2007 TEDX report is false. The SJNF and TRFO acknowledges some of the concerns raised by the 2008 QEPA report, particularly with respect to the identification of pathways by which chemicals can move to human receptors, however, to use that as a justification to ignore that potential health impacts on humans from chemicals used in exploration and production activities is counter to prudent land management practices. As used, the Colburn et al. 2010 is not identifying potential pathways, rather it is identifying the potential negative health impacts of the chemicals themselves. The guidelines for fluid additives have been revised in the FEIS/Supplement to the Draft EIS, and an additional requirement has been added to ensure full disclosure of chemicals used during exploration and production activities. These disclosure requirements mirror those required by COGCC Rule 205A.

WA51 Public Concern: The managing agencies should not make closed-loop drilling systems a blanket requirement.

The use of closed loop pitless drilling systems is required where feasible (see Standard 62.6.31). The water and soil related leasing stipulations and notices provide for exceptions to CSU stipulations, when approved by the Authorized Officer. These requirements are provided for under 43 USC 1712, as well as 43 CFR 228 and 43 CFR 3160.

WA52 Public Concern: The managing agencies should require operators to delineate an "area of review" around a well or group of wells that would be hydraulically fractured to identify pathways for contaminants to reach groundwater.

The specifics of monitoring/modeling and baseline data collection that are demanded by the commenter are beyond the scope of the EIS/Supplement to the Draft EIS. The level of detail demanded involves issues that could be considered during subsequent project level NEPA analysis and does not involve analysis at the BLM/USFS planning level. General monitoring guidelines are set forth within the CSU Stipulation for Municipal Watersheds and Public Water Supplies, and COGCC Rules 608, 317, and 317B are enforced on federal lands. Additionally the BLM/USFS retain the authority to be more restrictive in the application of monitoring/modeling when or if it is deemed necessary during subsequent levels of review.

# WA53 Public Concern: The managing agencies should require operators to identify all wells that penetrate the producing and confining zones to ensure they would not become conduits for injected or formation fluids.

The specifics of monitoring and baseline data collection that are demanded by the commenter are beyond the scope of the LRMP and FEIS and would be addressed during project-level analysis. However, a new guideline has been added creating a requirement for monitoring pressures in adjacent abandoned wells during high volume hydraulic fracturing operations.

## WA54 Public Concern: The managing agencies should require operators to collect baseline data to characterize water quality.

The specifics of monitoring/modeling and baseline data collection that are demanded by the commenter are beyond the scope of the LRMP/FEIS. The level of detail demanded involves issues that could be considered during subsequent project-level NEPA analysis and does not involve analysis at the BLM/USFS planning level. General monitoring guidelines are set forth within the CSU Stipulation for Municipal Watersheds and Public Water Supplies, and COGCC Rules 608, 317, and 317B are enforced on federal lands. Additionally the BLM/USFS retain the authority to be more restrictive in the application of monitoring/modeling when or if it is deemed necessary during subsequent levels of review.

# WA55 Public Concern: The managing agencies should include explicit documentation on the procedures for the safe reduction and sequestration of all waste materials to sludge. The exact specifics of the handling and disposition of drilling fluids are unknown at this time since

The exact specifics of the handling and disposition of drilling fluids are unknown at this time since no specific development proposals or plans have been submitted at this time. The SJNF and TRFO have established sufficiently stringent and flexible standards, guidelines, and leasing stipulations to ensure safe handling and disposition of drilling fluids. Additional, more detailed analysis would be performed at the project level when actual drilling proposals are evaluated during future NEPA analysis.

# WA56 Public Concern: The managing agencies should consider the risks related to water quality and unconventional fossil fuel extraction, such as shale gas.

The purpose of this analysis is to establish lands available for lease, not to lease lands, which would involve subsequent analysis. The broad standards, guidelines, and leasing stipulations brought forth with this document, combined with subsequent project-level analysis would sufficiently mitigate the impacts of fluid mineral development in the analyzed area. The SJNF and TRFO keep apprised of ongoing research in industry, academia, and other federal agencies (EPA, USGS). As the results of this research become available it would be integrated into subsequent NEPA analysis and decisions.

# WA57 Public Concern: The managing agencies should require detailed characterization, planning and baseline testing prior to any oil and gas development to protect groundwater.

The exact specifics of well design, construction, and monitoring of potential environmental impacts involve issues that would be considered during subsequent project-level NEPA analysis and does not involve analysis at the BLM/USFS planning level. General monitoring guidelines are set forth within the CSU Stipulation for Municipal Watersheds and Public Water Supplies, and COGCC Rules 608, 317, and 317B are enforced on federal lands. Additionally the BLM/USFS

retain the authority to be more restrictive in the application of monitoring when it is deemed necessary during subsequent levels of review.

# WA58 Public Concern: The managing agencies should include more protective measures for municipal watershed that are currently included in Appendix H.

The SJNF and TRFO believe that the existing NSO/CSU stipulations, standards, and guidelines are sufficiently protective of areas mentioned so as to prevent significant degradation of watershed resources.

# WA59 Public Concern: The managing agencies should require operators to disclose the chemicals that are used in hydraulic fracturing or to determine the chemical composition of flowback and produced water.

The standards, guidelines, and leasing stipulations of the Draft EIS/Supplement to the Draft EIS have been updated to require disclosure of fracking fluids to the SJNF and TRFO with the following language: "Operators shall include reports that disclose the complete chemical makeup of all materials and additives used in the proposed and actual drilling, completion, and stimulation fluids without regard to original source additive. Additionally, operators shall disclose the trade name, purpose, Chemical Abstracts Service Number, and percentage by mass for all chemicals used in the entire drilling, completion, and stimulation operation." The SJNF and TRFO is not under a legal obligation to provide the information demanded under the remainder of this comment and feels that the standards, guidelines, and leasing stipulations are sufficiently stringent to ensure that applicable laws, policies, and regulations are enforced.

## WA60 Public Concern: The managing agencies should include detailed requirements for water management plans.

The managing agencies understand the desire for extensive detail requested by the commenter. However, at this time a specific project has not been proposed. The elements listed by the commenter are important and have been addressed in a general manner in the FEIS. More detailed analysis would be conducted during project-level NEPA analysis.

# WA61 Public Concern: The managing agencies should incorporate a standard for the centralized liquid gathering systems including measures to exclude wildlife from the ponds. Specific measures such as those requested would be analyzed on a by case basis during subsequent NEPA review once specific project proposals are received.

## WA62 Public Concern: The managing agencies should make guidelines related to flowback and watertight tanks standards.

Standards and guidelines regarding flowback and watertight tanks have been revised. Please refer to the Water section of the Final LRMP.

# WA63 Public Concern: The managing agencies should include information regarding cooperation with local emergency responders and medical facilities regarding chemicals contained in fracing fluids.

Notification requirements for reporting spills are contained in COGCC Rule 906B as well as NTL-3A, disclosure of chemicals is provided for under COGCC Rule 205A. Additionally, disclosure of chemicals is required by guidelines and leasing Stipulations contained in the FEIS.

# WA64 Public Concern: The managing agencies should revise assumptions regarding the disposal of waste water and fracing material.

Assumptions regarding the disposal of waste water and fracing material have been revised. Please refer to the Water section of the FEIS.

# WA65 Public Concern: The managing agencies should add language to the discussion of injection wells to include information about underground injection control regulations in the state of Colorado.

Language regarding underground injection control regulations and injection wells has been revised. Please refer to the Water section of the FEIS.

# WA66 Public Concern: The water usage calculations in the Supplement to the Draft EIS seem contradictory and erroneous if based on the well projections disclosed in the same document.

Water calculations were completed for wells drilled on the federal mineral estate. Based on operator reports in similar situations, the SJNF and TRFO used 4.2 million gallons (100,000 barrels) per well, not the 6 million gallons the commenter used. Additionally the commenter did not account for the 40% recycle rate that is anticipated to be achieved on a large percentage (75%) of the wells (listed in the water assumptions). Usage of the 4.2 million gallons, 977 wells, and the anticipated recycle rates yields the approximate water usages discussed in the Supplement to the Draft EIS. The 1,800 well projection is addressed under cumulative impacts and refers to wells on both federal and non-federal lands.

# WA67 Public Concern: The managing agencies should provide clarification on the interaction of state (COGCC, CDPHE and Colorado Department of Water Resources) and federal regulations.

The guideline 3Ai has been removed as the wording was ambiguous, and was already covered under other regulations. A guideline for removal of pit liners from the site has been created, and the standard for closed loop drilling systems has been changed to a guideline such that the Authorized Officer can authorize exceptions when warranted. While the USFS and BLM agree that data related to the origin and amount of fresh water obtained for drilling and completion could be useful, water rights are administered exclusively by the State of Colorado.

WA68 Public Concern: The managing agencies need to ensure that adequate response plans are in place before spills or emergencies; the requirements in New York State's Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program (2011) should be used to accomplish this.

The requirements set forth within the referenced emergency response plan are already functionally achieved through the Application of COGCC and federal rules, including, but not limited to, COGCC Rules 317B, 906, and 908, BLM Onshore Order 3, and NTL-3A.

#### 4.33 Wild Horse Herd Management

- WH1 Public Concern: The managing agencies should elevate the Herd Management Area of Spring Creek Basin to Wild Horse Range status to protect the Spring Creek Basin herd. The wild horses in the Spring Creek Herd Management Area are protected under the Wild and Free-Roaming Horses and Burros Act of 1971. The designation of a range would not necessarily provide any additional protection.
- WH2 Public Concern: The managing agencies should revise the herd management level for the Spring Creek Basin Herd Management Area to ensure that the level is appropriate for the area.

LRMP components regarding wild horse herd management have been revised and include the desired population range. Please refer to the Wild Horse Herd Management Area section in the LRMP.

WH3 The managing agencies should broaden the objectives for wild horse herd management. The Wild Horse Management Area is primarily managed using the revised 2005 Wild Horse Herd Management Area Plan. The Herd Management Area Plan addresses concerns such as partnerships, population, genetics, and resource conditions. Additionally, resource issues such as controlling noxious weeds or preserving pygmy sagebrush are addressed in other areas of the Plan. There are existing leases in the herd management area that are developed and others undeveloped, but through the leases terms, provide the right to development. New leases issued under the requirements of the preferred LRMP address oil and gas development within the herd

management area. Commenters are also encourage to review the Additional Guidance section of the Wild Horse Herd Management Area portion as that section addresses many of the concerns of wild horse herd management beyond what is addressed in this LRMP.

#### 4.34 Wild and Scenic Rivers

## WS1 The managing agencies should explain how management guidance for streams identified as suitable would be developed.

General management guidance for stream segments found suitable is provided in FSH 1909.12 Chapter 80 and BLM Manual 6400. Both of these documents provide management guidelines for how agencies are to preserve river characteristics pending any action by Congress to designate or release rivers from further study. The guidelines address a number of management concerns, including proposed water resources projects, hydroelectric projects, minerals extraction, road and trail construction, utility rights-of-way, motorized travel, fish and wildlife projects, vegetation management, recreational facilities, and livestock grazing. In most cases, the guidelines presented in the handbook and manual provide for authorization of these activities as long as 1) the free-flowing nature of the segment is preserved, 2) ORVs are protected, and 3) the proposed action would not degrade the classification (i.e., wild, scenic, or recreational) identified in the inventory or subsequent suitability analysis. The guidelines provided in the two documents are not to be repeated in agency plans, but are to be reflected in various plan components such as desired conditions, objectives, guidelines, and suitable uses to enable review of proposed design of projects and activities. Future NEPA review of proposed projects would offer opportunities for detailed consideration of the handbook and manual guidelines, as well the application of LRMP components. These future reviews would also offer opportunity for public input and collaborative efforts to help ensure workable solutions.

# WS2 The managing agencies should clarify the conflicting information in the Draft LRMP and Draft EIS regarding the San Juan River system.

Specific comments identified what was perceived as a conflict between WSR determinations and management area guidance for areas of NFS lands, in particular the use of MA 4. WSR findings or determinations of suitability are not necessarily in conflict with the MA 4 guidance, especially for stream segments classified as scenic or recreational. MA 4 would, however, include additional restrictions on timber harvest and mineral development in addition to what might otherwise be allowable under FSH 1909.12 Chapter 80 guidelines for interim protection of suitable stream segments.

# WS3 The managing agencies should include a full discussion of potential water rights conflicts. The Draft EIS did disclose potential conflicts with water rights and proposed water developments. Additional discussion of these potential conflicts has been included in the FEIS and revised Appendix D. Furthermore, FSH 1909.12 Chapter 80 and BLM Manual 6400 include guidelines to be followed in reviewing water development proposals. The USFS Handbook, for instance, requires that water resources projects be analyzed "as to their effect on a river's free-flow, water quality, and outstandingly remarkable values (ORVs), with adverse effects prevented to the extent of existing agency authorities (such as special-use authority)." The BLM and USFS have long provided interim protection to several stream segments previously found suitable within the planning area with few conflicts with water users and valid existing rights. Should a river segment be designated wild and scenic by Congress, there would indeed be a federal reserved water right associated with it. The appropriation date for such a right would be the date of the act establishing the WSR. This right would be administered through the state's water court system like other existing water rights.

Throughout Appendix D, the work of several community-based river study groups has been acknowledged. To date, these groups have spent a great deal of effort identifying and considering potential conflicts with water rights and future water developments. Final reports of these groups would be made available as additional information to be reviewed if the wild and

scenic river recommendation is made to Congress to help ensure that efforts to designate rivers under the Wild and Scenic Rivers Act (WSRA) are well informed of potential conflicts.

## WS4 The managing agencies should include a full discussion of potential positive and negative impacts of WSR designation.

Additional information has been added to the FEIS and revised Appendix D in response to this comment. In addition, BLM Manual 6400 and FSH 1909.12 Chapter 80 provide details on how proposed water resources projects are to be reviewed. See also the response to WS3.

## WS5 The managing agencies should provide a full discussion of the compelling need for WSR designation.

The WSRA requires "consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved" (WSRA Section 5(d)).

Alternatives to potential wild and scenic river designation are discussed in Appendix D. Determinations of suitability are based on a review of these options. In addition, Appendix D acknowledges the efforts of community-based river workgroups that have been exploring options to WSR designation and states that the final reports of these groups would be made available as additional information to be reviewed if the WSR recommendation is made to Congress to help ensure that efforts to designate rivers under the WSRA are well informed of potential conflicts.

# WS6 The managing agencies should conduct a WSR suitability designation review process outside the Draft LRMP and Draft EIS revision process.

As acknowledged in several comments, the agencies require a review of eligibility through planning documents and state a preference for making determinations of suitability during land use planning. For this particular effort, the agencies chose to complete suitability determinations through the LRMP revision process. Rationale for completing suitability determinations through the BLM and USFS plan revisions include: 1) the LRMP revisions present an appropriate opportunity for public involvement, 2) determinations can be made in context with all other planning decisions, 3) WSR analysis in the LRMP revision process is much more efficient in terms of staff time and other production expenses, and 4) determinations at this time allow eligible stream segments that are not determined to be suitable to fall back to being managed according to general management for the planning area as described in the various LRMP components, precluding the need to apply WSR interim guidelines to those segment not determined to be suitable.

## WS7 The managing agencies should appropriately establish the percentage of land in private versus federal ownership as required for WSR designation.

Comments were concerned with what was perceived as misleading information stemming from the aggregation of federal and private miles of stream and acreage presented in the tables of Appendix D. Linear distance and land area estimates were presented in Appendix D in an effort to display the very differences identified by the commenter and were completed in accordance with agency guidance for preparing the appendix.

## WS8 The managing agencies should, or should not, list certain segments of various rivers as suitable for WSR designation.

Segment-specific comments and brief responses are provided in Appendix D. Appendix D also includes the rationale for why the agencies identified potential WSR designation as the most appropriate method of protecting the free-flowing character of the suitable stream segments and their ORVs. Some segments have had changes made to the suitability finding since the Draft EIS was published.

### WS9 The managing agencies should not request federal reserved water rights on the Dolores River below McPhee.

A federal reserved water right would be established for a WSR established through Congress per the WSRA. The responsible federal management agency would, therefore, not request a reserved water right but would be involved in quantifying that right should Congress pass legislation to establish a WSR. Water availability and the amount of water needed to protect the ORVs carried forward in legislation would be considered in making this quantification.

- WS10 The managing agencies should not designate the Piedra or San Juan Rivers as WSR because federal reserve water rights would impede water service to landowners.

  Additional information has been added to the FEIS and revised Appendix D in response to this comment. In addition, BLM Manual 6400 and FSH 1909.12 Chapter 80 provide details on how proposed water resources projects are to be reviewed. See also the response to WS3.
- WS11 The managing agencies should clarify why a wilderness designation and Colorado Water Conservation Board Instream Flow water rights are insufficient to safeguard ORVs.

  Segment-specific comments and brief responses are provided in Appendix D. Depending on the specific ORVs identified for a stream reach, wilderness designations or State of Colorado instream flow protections may provide sufficient protection of stream values. However, neither the Wilderness Act nor the Colorado Instream Flow Program is intended to fully protect free-flowing character or stream-specific ORVs.
- WS12 The managing agencies should explain how ORVs for recreation are determined. The eligibility criteria are: "Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. The river may provide settings for national or regional usage or competitive events."
- WS13 The managing agencies should specify that the update of the 1990 Dolores River Management Plan would be used to reconcile SJNF and TRFO's obligations with Dolores Water Conservancy District obligations.

The Dolores River Management Plan would be one useful tool that is used to resolve and reconcile the complex water issues associated with the Dolores River. However, the LRMP does not specify that the update of the Dolores River Management Plan would be the only avenue through which these issues could be resolved.

WS14 The managing agencies should explain how the Navajo Trail and eight other trails leading out of the Dolores River Corridor are related to WSR eligibility designation for the river itself.

These trails are not related to eligibility. A comprehensive description of transportation and facilities is required for each segment in Appendix D, and these trails are described because they are in the corridor. This comment appears to be directed toward the West Dolores River. Agency guidance requires the disclosure of transportation and other facilities within the study river corridor in river suitability analyses. The West Dolores was not found suitable in Appendix D.

WS15 The managing agencies should ensure that landowners adjacent to the Dolores River would not be negatively affected by management decisions.

Findings of suitability and WSR designation do not directly affect private property rights. The WSRA confers no federal authority over private land use or local zoning. Private portions of study river segments are included in suitability analyses to provide context and to disclose potential conflicts that could stem from mixed ownership. Including private portions of steam segments in the study of eligibility and suitability can also help to inform Congress, federal, state and local governments, and private citizens in their future decision making.

Where private landowners need access or other improvements on public lands within designated WSR corridors, the proposed uses would be evaluated based on how they would affect the free-flowing character of the stream segment and how they might impact the classification of the river (i.e., wild, scenic, or recreational) and the identified ORVs. For river segments designated with a recreational classification, the construction of roads and even bridges is not necessarily prohibited, but the ORV of scenery could restrict such improvements on public lands.

There are a number of publications available that explore the impacts of WSR designation on private property. A 2008 Report to the Utah Governor's Public Lands Office titled *Impacts of Wild and Scenic River Designation* (Keith, J., et al., Utah State University) provides a general discussion of the various impacts of designation and a survey of published literature that may be useful for commenters further review.

#### 4.35 Wilderness, Wilderness Study Areas

WW1 Public Concern: The managing agencies should continue to provide for multiple use on lands outside of WSA because the BLM may not unlawfully apply the WSA non-impairment standard to lands found to contain wilderness characteristics.

As directed by IM-2011-154, the BLM conducted an inventory of wilderness resources, which is detailed Appendix O. The IM clearly states that the findings of the inventory are not to be used to make final management determinations for these areas, rather that wilderness characteristics (if found) would be considered among other resource values in the planning process.

## **Appendix T**

# San Juan National Forest Biological Evaluation and Bureau of Land Management Sensitive Species Analysis

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# 1 U.S. FOREST SERVICE TERRESTRIAL WILDLIFE BIOLOGICAL EVALUATION

#### 1.1 Introduction

This biological evaluation (BE) discloses the potential influences on the revision of the U.S. Forest Service (USFS) San Juan National Forest (SJNF) Land and Resource Management Plan (LRMP) on USFS Rocky Mountain Region (Region 2) sensitive. The list of Region 2 Regional Forester sensitive species was updated on June 10, 2011.

The Forest Service Manual (FSM) 2670 directs the USFS to develop and implement management practices to ensure that sensitive species do not become threatened or endangered because of USFS actions (FSM 2670.22). Sensitive species are those plant and animal species identified by a Regional Forester for which population viability is a concern as evidenced by a) significant current or predicted downward trends in population numbers or density or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (FSM 2670.5).

FSM 2670 directs the USFS to prepare BEs for projects, as part of the National Environmental Policy Act of 1969 (NEPA) process, to determine the potential effects from those projects on sensitive species and to ensure that USFS actions do not contribute to loss of viability of threatened, endangered, proposed, or sensitive plant and animal species or contribute to a trend towards federal listing of any species under the Endangered Species Act (ESA) (FSM 2672.41 and 2670.32). A BE is as a documented review of USFS programs or activities in sufficient detail to determine how an action or proposed action may affect any threatened, endangered, proposed, or sensitive species (FSM 2670.5).

#### 1.1.1 Project Description

The LRMP would guide relevant resource management programs, practices, uses, and protection measures. The associated Final Environmental Impact Statement (FEIS) examines potential environmental effects that could occur as a result of implementing projects associated with the LRMP.

The key decisions made in this integrated plan for long-term management of the SJNF are:

- Establishment of desired outcomes, including multiple-use goals and objectives.
- Establishment of management requirements, including criteria that would be applied to guide day-to-day activities. These are primarily expressed as standards and guidelines and other design criteria.
- Establishment of management area direction, including identifying allowable uses, or allocations, restrictions, and prohibitions. All lands within the planning area are allocated to one of seven management areas, or zones, that reflect different levels of development and suitable uses or activities.
- Designation of suitable timber land and establishment of allowable sale quantity.
- Establishment of monitoring and evaluation requirements.

#### 1.1.2 Project Area

The project area is the SJNF boundary, located in southwest Colorado at the junction of the Southern Rockies and the Colorado Plateau ecoregions. The Colorado Plateau portion is characterized by sedimentary geology dominated by deep canyons and mesas. The Southern Rocky Mountains portion is characterized by mountains with mixed geology. Life zones represented in the planning area include Semi-Desert, Lower Montane, Upper Montane, Subalpine, and Alpine. The area encompasses about 1,864,831 acres of National Forest Service (NFS) land and includes lands in Archuleta, Conejos, Dolores, Hinsdale, La Plata, Mineral, Montezuma, Montrose, Rio Grande, San Juan, and San Miguel Counties. The west border of the planning area is the Utah state line. The southern border of the planning area is the New Mexico state

line. The eastern border is the Continental Divide. The northern border covers the administrative boundaries with the Rio Grande, Gunnison, Grand Mesa, and Uncompander National Forests.

#### 1.1.3 Alternatives

Four issues drove the development of four alternatives:

- Issue 1. Balancing Management between the Ideas of Maintaining "Working Forest and Rangelands" and Retaining "Core Undeveloped Areas"
- Issue 2. Providing for Recreation and Travel Management within a Sustainable Ecological Framework
- Issue 3. Management of Special Areas Designations and Unique Landscapes
- Issue 4. Oil and Gas Leasing and Development

The four alternatives are summarized below:

**Alternative A (No Action):** Alternative A represents the continuation of current management direction under the existing USFS land management plans. Alternative A meets the requirements of NEPA (40 Code of Federal Regulations [CFR] 1502.14) that a No Action Alternative be considered. "No Action" means that the alternative reflects the implementation of existing management goals, objectives, and management practices based on the existing land use plans. Alternative A also serves as the baseline for comparing and contrasting the impacts of the other alternatives. Alternative A is based on reasonably foreseeable actions, existing planning decisions and policies, and existing land use allocations and programs.

The activities projected under Alternative A are based more on historical and expected output levels than on projections of outputs from the earlier land management plans. For example, the SJNF has been selling about one-half as much timber as was estimated in the existing plan due to both budget constraints and lower demand for wood products and periodically revised adjustments of the capacity of the SJNF to supply timber. Continuation of current management reflects this adjustment to program activities.

Alternative B (Preferred Alternative): Alternative B, the Preferred Alternative, provides for a mix of multiple-use activities, with a primary emphasis on maintaining most of the large, contiguous blocks of undeveloped lands, enhancing various forms of recreation opportunities, and maintaining the full diversity of uses and active forest and rangeland vegetation management. Alternative B focuses on balancing the goals of maintaining "working forest and rangelands" and of retaining "core, undeveloped lands." Uses and activities that require roads, such as timber harvesting and oil and gas development, would be mostly focused in areas that already have roads. Relatively undeveloped areas and areas that currently do not have roads would, for the most part, remain that way. The alternative provides direction considered most responsive to the issues and management concerns raised during public scoping. Alternative B is described in detail in the LRMP.

Alternative B also incorporates the goals of the USFS's Strategic Plan (36 CFR 219.12(f)(6).

The Responsible Official, the Regional Forester, has identified Alternative B as the Preferred Alternative in the FEIS.

**Alternative C:** Alternative C provides for a mix of multiple-use activities with a primary emphasis on maintaining the undeveloped character of the planning area. Production of goods from vegetation management would continue, but might be secondary to other non-commodity objectives. Under Alternative C, production of goods and services would be more constrained than that proposed under Alternatives A, B, and D. And, in some cases and in some areas, uses would be excluded in order to protect sensitive resources. Alternative C identifies more resources and areas for special designation than the other alternatives. Management provisions under this alternative would emphasize the undeveloped character of large blocks of contiguous land and non-motorized recreational activities to a greater degree than would any of the other alternatives.

**Alternative D:** Alternative D, as reflected in its land allocations, provides for a mix of multiple-use activities, with a primary emphasis on the "working forest and rangelands" concept in order to produce a higher level of commodity goods and services when compared to the other alternatives.

The differences between the four alternatives and their potential implications to sensitive species can be analyzed by the different management areas they are associated with. Management areas outline uses and activities that may occur in them. All SJNF lands have been allocated to one of seven management areas that range from areas where natural processes dominate and shape the landscape to areas that are highly developed. In general, those alternatives that allow a higher level of management intensity may also require a higher level of management attention to the protection and maintenance of habitats for species that are sensitive to habitat alteration and/or human disturbances. A summary of the differences in management areas by alternative is displayed below.

#### 1.1.4 Management Area Allocations

The management area prescriptions, which represent the allocation of SJNF lands to various emphases, have been assigned to land areas of the on the SJNF as follows in Table T.1.

Table T.1: Management Area Allocations on San Juan National Forest Lands

Management Area Allocations	Preferred Alternative (acres)
MA 1 - These are areas of the SJNF where natural processes would dominate and determine the vegetative characteristics of wildlife habitats. These areas include the Weminuche, Lizard Head, and South San Juan wildernesses, the Piedra Area, and other undeveloped areas identified for limited management, including the west half of the Hermosa roadless area, the San Miguel roadless area and areas adjacent to existing wilderness.	598,517
MA 2 - These are areas of the SJNF that would be managed as special areas and unique landscape areas. These areas include research natural areas, special botanical areas, and archaeological areas.	91,985
MA 3 - These are areas of the SJNF that would be managed as natural landscapes with limited management. They are relatively unaltered lands and places where natural ecological processes would operate primarily free from human influences. Succession, fire, insects, disease, floods, and other natural processes and disturbance events would predominantly shape the composition, structure, and landscape patterns of wildlife habitats.	596,119
<b>MA 4</b> - High-use recreation emphasis areas: These areas are places with relatively high levels of recreation use that would be managed in order to provide for a broad spectrum of visitors. They include popular recreation destinations such as lakes and campgrounds, and travel corridors valued for their scenery, including scenic byways.	69,864
MA 5 - Areas designated as active management: These areas include roaded areas where active management would continue to occur in order to meet a variety of social, economic, and ecological objectives. These are lands where timber harvesting, oil and gas activities, and intensive livestock grazing would continue to occur and influence the composition, structure, and landscape patterns of the vegetation.	451,730
MA 7 - Public and private lands intermix: These areas are places where the SJNF is in close proximity to private lands. These areas would be a priority for fuels and vegetation treatments in order to reduce wildfire hazards. Winter range for deer and elk is a common component of MA 7s, as are seasonal closures in order to reduce animal disturbance.	49,560
MA 8 - Highly developed areas: These areas include downhill ski areas and the McPhee dam on SJNF lands.	7,056
Total Acres	1,864,831

The management area allocations provide for managing approximately 1.3 million acres as unroaded with limited activities and to function as core habitat areas. These protected areas are lands that would be dedicated to the protection and maintenance of biological diversity. They would serve as conservation reserves and refuges to protect the native biodiversity within them and would provide wildlife movement corridors and linkage areas that connect landscapes and habitats which facilitates the interaction of animals.

#### 1.1.5 Overarching Land and Resource Management Plant Direction— Species Conservation

A new management plan has been developed for the SJNF (the Proposed Action). With this LRMP, there is direction that implements a systematic approach to the management of biological diversity and species conservation on the SJNF (see Appendix Q). As a basis, the management of wildlife on the SJNF is guided by laws, regulations, and policies that prescribe management requirements for the public lands. USFS 36 CFR 219.19 requires that "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area." Regulation 36 CFR 219.26 requires that forest planning provide for diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area. Such diversity would be considered throughout the planning process.

To address these requirements, the LRMP's sustainable ecosystems strategy would provide the ecological framework for the conservation and management of ecosystems, habitats, and species occurring on the SJNF. The sustainable ecosystems strategy includes a four-pronged approach that frames wildlife, fish, and plant species program direction on the SJNF: 1) the designation and management of protected areas, which include SJNF wilderness areas, the Piedra Area, Colorado Roadless Areas (CRAs), and research natural areas; 2) the application of ecosystem management using sustainable ecosystem concepts; 3) the development and application of the LRMP components (desired conditions, objectives, standards, and guidelines) that provide a framework for the management and preservation of ecosystems; and 4) the monitoring of effects of management activities on the SJNF and application of adaptive management principles in response to monitoring results. Effective monitoring and evaluation of how SJNF management activities are affecting ecosystems and wildlife, and the application of adaptive management principles, would be critical to maintaining functional, sustainable ecosystems and addressing the needs of dependent species. Refer to Section 4.0 of the LRMP for a review of the monitoring requirements.

Protected areas are lands that the USFS has dedicated to the protection and maintenance of biological diversity. They would serve as conservation reserves and refuges to protect the native biodiversity within them and would provide wildlife movement corridors and linkage areas that connect landscapes and habitats which facilitates the interaction of animals. Establishing and preserving protected areas on the SJNF is a means to maintain ecosystem diversity. Protected areas are established to ensure ongoing species diversity and maintain the population viability of native plant and animal species and communities. Approximately 566,053 acres of the SJNF are within CRAs and would be managed according to the direction of the Colorado Roadless Rule. Protected areas comprise 54% of the SJNF; 153,194 of those acres are within more restrictive upper tier CRAs. While CRAs do allow for some activities, these areas more or less are undeveloped, where management activity is limited and in overall serve as refuges that provide for wildlife movement and relatively undisturbed habitat.

Ecosystem management is the integrating component of the sustainable ecosystems strategy. Ecosystem management on the SJNF, which uses the historical range of variability (HRV) for reference, would be implemented by maintaining or restoring the composition (plant species, animal species, and vegetation types), structure (size, density, and arrangement of live and dead vegetation, stream channel attributes), function (ecological processes and disturbances), and physical environment (soils, water, and geomorphology) of ecosystems. The approach is intended to protect and maintain these ecosystems and ensure the diversity and population viability of the majority of species within them.

Wildlife species that may not be adequately recognized or protected by the above ecosystems management approach, or whose specific habitat needs or other life requirements may not be fully met

under the sustainable ecosystems strategy, are given special management considerations, including the development of LRMP components that contribute to the conservation of those species. In addition, current species-specific conservation plans and strategies would be relied upon to address the needs of special status species. These plans and strategies are discussed within the applicable resource sections of the LRMP. These plans and strategies are analogous to the Nature Conservancy's fine-filter approach, which is intended to protect species with known conservation concerns (Hunter et al. 1988; Nature Conservancy 1982; Noss 1987,).

Overall, the LRMP provides management direction that is intended to provide for species diversity and population viability goals described above. The process has been to identify a range of key ecosystem elements, determine the importance of those elements to maintaining species diversity and population viability (e.g., limiting factors), define desired future conditions and land management objectives for those elements, and ensure that appropriate management standards and guidelines are in place that address the ecological needs of species and populations. In general, management standards are provided for those elements determined to have an overriding influence on species diversity or long-term population viability, while other elements that have less influence are addressed through the application of management guidelines. The relevant standards and guidelines, along with desired conditions and management objectives, and leasing stipulations, are listed in Appendix B.

#### 1.1.6 Design Criteria

The design criteria listed below address those species for which there are species-specific design criteria. The LRMP contains over 100 additional components, including design criteria (standards and guidelines) objectives, and desired conditions that are meant to help provide for the ecological conditions in key habitat types necessary for all species. These components are outlined in Appendix M.

**Standard:** A standard is an approach or condition that has been determined to be necessary to meet desired future conditions and objectives, and/or to ensure the long-term viability of resources. A standard (worded as "must" or "shall") describes a course of action that must be followed or a level of attainment that must be reached. Deviations from standards would require analysis and documentation through a subsequent land management plan amendment.

**Guideline:** A guideline (worded as "should") is a requirement that the USFS has established to meet desired future conditions and objectives, and/or to ensure the long-term viability of resources. Guidelines are put forward in the LRMP in recognition that there may be circumstances that could generate or require alternative, more appropriate means for meeting desired future conditions and objectives, and/or to ensure the long-term viability of resources. It is also recognized that there may be limited individual circumstances where the need for a guideline no longer exists or the applicability of a guideline is otherwise altered (e.g., changes is surrounding land use that may render a guideline ineffective). In these situations a guideline has been determined to be more appropriate than a standard by allowing some flexibility in approach as conditions change and new information is obtained.

#### **Standards**

- **2.3.37. Bats:** If abandoned mines are closed, surveys will be conducted to determine occupancy. If surveys cannot be completed, occupancy will be assumed and mine closures must allow for bat access. Abandon mines that are determined to be hazardous to bats will be closed to bats.
- **2.3.38. Bats:** Human access at occupied caves or abandoned mines will be restricted as necessary during the following periods to maintain essential life cycle processes:

Maternity sites - April 15 through September 1

Swarming sites - August 15 through October 15 (30 minutes before sunset to 30 minutes after sunrise)

Winter hibernacula - October 15 through May 15

- **2.3.39. Bighorn sheep (***Ovis canadensis***):** During project-level planning on domestic sheep (*O. aries*) allotments, management options must be developed to prevent physical contact between domestic sheep and bighorn sheep. Actions may include but are not limited to boundary modification, livestock-type conversion, or allotment closures.
- **2.3.40. Bighorn sheep:** Grazing permit administration in occupied bighorn sheep habitat must utilize measures to prevent physical contact between domestic sheep and bighorn sheep. Permit administration actions may include but are not limited to use of guard dogs, grazing rotation adjustments, or relocation of salting and bed grounds.
- **2.3.41. Bighorn sheep:** Management of recreational pack goats and other domestic goats (*Capra aegagrus hircus*) must utilize measures to prevent physical contact with bighorn sheep.
- **2.3.42. Bighorn sheep:** Domestic goats used for invasive plant control must be veterinarian certified as free of pathogens transmissible to bighorn sheep, except in areas where there is no risk of contact with bighorn sheep.
- **2.7.11.** Grazing permit administration in occupied bighorn sheep habitat must utilize measures to prevent physical contact between domestic sheep and bighorn sheep. Permit administration actions may include but are not limited to use of guard dogs, grazing rotation adjustments, or relocation of salting and bed grounds.
- 2.7.12. Management of domestic sheep must utilize measures to prevent physical contact with bighorn sheep.
- **2.3.43. Butterflies:** Management actions that could adversely impact occupied habitat used by special status butterfly species for reproduction must be designed to sustain host plant species.

#### Guidelines

- **2.3.51. Bats:** Human access should be managed at caves and abandoned mines where known bat populations exist to protect bat habitat from disturbance and/or the introduction of pathogens. Management examples include, but are not limited to, seasonal or permanent closures and excluding humans by installing bat gates.
- **2.3.52. Bats:** Where known bat concentrations of significant conservation concern are located outside caves or abandoned mines (such as in bridges structures, rock crevasse, or tree snags), human disturbance should be managed in order to protect those populations and the concentration site's physical features.
- **2.3.53. Bats:** On the SJNF, formal mineral withdrawal of abandoned mines for conservation of special status bat species should be pursued when demonstrated necessary to prevent loss of effective or crucial habitat due to mining activity.
- **2.3.54. Bats:** At swarming sites, hibernacula, and maternity sites, activities that may alter the suitability of the cave or abandoned mine for bat occupation should not occur within 500 feet of the entrance, unless to rehabilitate the suitability of the site.
- **2.3.64. Bighorn sheep:** Projects or activities that adversely impact bighorn sheep production areas reducing habitat effectiveness should be limited or avoided, using access restrictions during the following periods (see Figure 2.3.3 in the LRMP):

Rocky Mountain bighorn sheep (Ovis canadensis canadensis): April 15-June 30

**2.3.65. Bighorn sheep:** Projects or activities that adversely impact bighorn sheep severe winter range and winter concentration areas reducing habitat effectiveness should be limited or avoided using access restrictions during the following periods:

Rocky Mountain bighorn sheep: November 1-April 15

Raptor standards and guidelines are included in Table T.2 (excerpt from rom Standard 2.3.35 and Guideline 2.3.49 in the LRMP):

Table T.2: Raptor Timing and Buffer Zone Distance Standards and Guidelines

Species	Impact/Risk	Time Frame	Buffer Distance****	Source
Bald eagle	Structural improvements *	Year round	New structures must not occur within a 0.5-mile radius of an active nest. (S)***	SJNF
Disturbance ** November 15–July Human encroachment show within 0.5 mile of an activ		Human encroachment should not occur within 0.5 mile of an active nest during the nesting season. (G)***	SJNF	
Bald eagle winter roost	Structural improvements *	Year round	New structures must not occur within 0.5 mile of a communal roost site. (S)	SJNF
	Disturbance **	November 15– March 15	Human encroachment should not occur within a 0.25-mile radius (indirect line of sight) or a 0.5-mile radius (direct line of sight) of a communal winter roost site (as identified by CPW and the managing agency biologist). (G)  Limit activity between 10 a.m. and 2 p.m. if encroachment will occur within buffer zones. (G)	CPW 2008
Northern goshawk	Disturbance **	March 1–August 31	Human encroachment should not occur within 0.5 mile of a nest during the nesting season. (G)	SJNF
	Structural Improvements *	Year-round	New structures should not occur within a 0.5-mile radius of an active nest. (G)	CPW 2008

Structures include improvements such as roads, trails, radio towers, power lines, aboveground transmission corridors, and wells as proposed following nest establishment. This is not intended to include structures that historically occurred in the area prior to

Table information is based on a variety of sources, including 2008 Colorado Parks and Wildlife Raptor Guidelines, Romin and Muck (2002) Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances, professional knowledge of local area conditions, Reynolds' (USFS 2004) recommendations specific to the SJNF, Bald and Golden Eagle Protection Act conformance, and Bureau of Land Management oil and gas standardized stipulation. Where literature and other evidence shows, exceptions may occur when individuals are adapted to human activity. Management is designed to reduce impacts during sensitive periods.

- **2.5.25.** Activities that may cause sedimentation to amphibian habitats should be minimized.
- 2.5.26. Drainage of acid-mine runoff into riparian areas and wetland amphibian habitats should be avoided.
- 2.5.27. Agency actions should avoid or mitigate impacts within 100 feet of boreal toad (Bufo boreas boreas) breeding sites between May 15 and September 30 (breeding season).
- 2.5.28. Agency actions should maintain or improve hydrologic function and water quality of known and historic breeding sites for all sensitive and listed aquatic and amphibious species to provide for effective habitat.

<sup>\*\*</sup>This does not apply to historic levels and patterns of disturbance under which the nest was established and is intended to apply to additional levels and change in disturbance patterns.

<sup>\*</sup>Golden and bald eagle nest as defined under the Bald and Golden Eagle Protection Act.

<sup>\*\*\*\*\*</sup>Buffer distances for some species may vary based on site-specific information, current science, and agency wildlife biologists' professional judgment. Area closures may be considered where appropriate. Note: (S) = Standard; (G) = Guideline.

2.13.29 Road and Motorized Trail Density Guideline for Ungulate Production Areas, Winter Concentration Areas, Severe Winter Range, and Critical Winter Range on SJNF Lands: The intent of this guideline is to ensure no net loss of existing habitat effectiveness within the areas listed below. In order to maintain wildlife habitat effectiveness of SJNF lands, road and motorized trail densities should be addressed when analyzing and approving management actions that affect motorized routes. Where management actions would result in road and motorized trail densities exceeding 1 mile/square mile on SJNF lands in the areas listed below, actions should be designed to maintain habitat effectiveness on SJNF lands throughout each mapped polygon. Habitat effectiveness for this guideline is considered maintained when road densities within the CPW mapped areas on SJNF lands listed below are less than or equal to 1 mile/square mile. When road densities exceed 1 mile/square mile within the CPW mapped areas on SJNF lands listed below, densities should not be increased without mitigation designed to maintain habitat effectiveness.

- Big game production areas (calving or lambing areas)
- Elk and deer severe winter range
- Elk and deer winter concentration areas
- Deer critical winter range

The following parameters and constraints will be used to calculate road and motorized trail density for wildlife:

- 2.13.29a Roads used to develop route density calculations include roads on NFS lands only, regardless of road ownership, that are a) open year-long or seasonally to public use and b) closed to public use, but are used for administrative access or are authorized by contract, permit, or other written authorization. Included in these calculations are maintenance level 2–5 NFS roads. Also included for this calculation are NFS trails that are designated for motorized use. Roads and motorized trails with design features sufficient to maintain habitat effectiveness (such as seasonal closures that are determined to be sufficient mitigation), as determined by the USFS biologist, should not be used for final density calculations. Non-motorized trails and those roads that are closed to all motorized use and/or are in storage are not used for route density calculations. Temporary roads to be used for 5 years or less are not included in these calculations.
- **2.13.29b** Data used for density calculations will be based on the best available information at the time of analysis.

**2.13.31** Road and Motorized Trail Density Guideline for Deer and Elk General Winter Range on SJNF Lands: Where management actions would result in road and motorized trail densities exceeding 1 mile/square mile and where CPW analysis determines that road and motorized trail densities inhibit the state's ability to meet population objectives, SJNF management actions should be designed to reduce the impacts of road density on habitat effectiveness throughout each mapped general winter range polygon. This guideline applies to the portions of each mapped general winter range polygon not covered under Guideline 2.13.29.

The following parameters and constraints will be used to calculate road and motorized trail density for wildlife:

2.13.31a Roads used to develop route density calculations include roads on NFS lands only, regardless of road ownership, that are a) open year-long or seasonally to public use and b) closed to public use, but are used for administrative access or are authorized by contract, permit, or other written authorization. Included in these calculations are maintenance level 2–5 NFS roads. Also included for this calculation are NFS trails that are designated for motorized use. Roads and motorized trails with design features sufficient to maintain habitat effectiveness (such as seasonal closures that are determined to be sufficient mitigation), as determined by the USFS biologist, should not be used for final density calculations. Non-motorized trails and those roads that are closed to all motorized use and/or are in storage are not used for route

density calculations. Temporary roads to be used for 5 years or less are not included in these calculations.

**2.13.31b** Data used for density calculations will be based on the best available information at the time of analysis.

Land allocations and resource activities proposed for alternatives, which may affect species or their habitats, are summarized in Tables T.3 through T.9.

Table T.3: Acres of Management Areas by Alternative

Management Area	Alternative A	Alternative B	Alternative C	Alternative D
MA 1 natural processes dominate	483,869	598,517	1,016,281	497,856
MA 2 special areas and unique landscapes	8,949	91,985	86,295	59,602
MA 3 natural landscapes w/limited	755,418	596,119	245,753	710,990
management				
MA 4 high use recreation emphasis	148,022	69,864	46,502	79,854
MA 5 active management	454,035	451,730	426,507	454,137
MA 7 public and private lands intermix	N/A	49,560	40,679	49,547
MA 8 highly developed areas	14,538	7,056	2,814	12,845
(ski areas and dams)				
Total	1,864,831	1,864,831	1,864,831	1,864,831

Table T.4: Timber and Fuels Treatment Activities That May Impact Species or Their Habitats over the Life

of the Land and Resource Management Plan for all Species (acres)

Management Activity	Alternative A	Alternative B	Alternative C	Alternative D
Total acres	721,477	707,016	478,018	719,208
where timber	, ==,	, , , , , , ,	., .,	, -, -, -, -, -, -, -, -, -, -, -, -, -,
harvesting may				
occur				
		<b>Timber Treatment (NF</b>	S lands)	
Ponderosa pine	1,000 Rest*	1,000 Rest*	900 Rest*	1,500 Rest*
acres treated	500 PC	500 PC	400 PC	500 PC
Warm dry	250 Rest*	250 Rest*	200 Rest*	500 Rest*
mixed conifer	250 PC	250 PC	225 PC	250 PC
acres treated				
Cool moist	400 PC	250 PC	40 PC	575 PC
mixed conifer				
acres treated				
Aspen acres	400 CC	500 CC	400 CC	600 CC
treated				
Spruce-fir acres	100 PC	100 PC	40 PC	226 PC
treated				
	<del>.</del>	Fuels Treatmen		
Pinyon-juniper	500 Mastication	500 Mastication	500 Mastication	1,000 Mastication
	500 Prescribed Fire	500 Prescribed Fire	500 Prescribed Fire	500 Prescribed Fire
Mixed	2,000 Mastication	2,000 Mastication	2,000 Mastication	2,000 Mastication
shrubland	1,000 Prescribed Fire	1,000 Prescribed Fire	1,000 Prescribed Fire	1,000 Prescribed Fire
Ponderosa pine	1,000 Mastication	1,000 Mastication	1,000 Mastication	1,500 Mastication
	3,500 Prescribed Fire	3,500 Prescribed Fire	3,500 Prescribed Fire	3,500 Prescribed Fire
	500 Mechanical Rest**	500 Mechanical Rest**	500 Mechanical Rest**	500 Mechanical Rest**
Warm dry	1,000 Prescribed Fire	1,000 Prescribed Fire	1,000 Prescribed Fire	1,000 Prescribed Fire
mixed conifer	500 Mechanical Rest**	500 Mechanical Rest**	500 Mechanical Rest**	500 Mechanical Rest**

Management	Alternative A	Alternative B	Alternative C	Alternative D
Activity				
Mixed	Up to 20,000 Fire	Up to 50,000 Fire	Up to 50,000 Fire	Up to 50,000 Fire
vegetation Managed for Resource		Managed for Resource	Managed for Resource	Managed for Resource
	Benefit	Benefit	Benefit	Benefit
Spruce-fir	Up to 20,000 Fire	Up to 50,000 Fire	Up to 50,000 Fire	Up to 50,000 Fire
	Managed for Resource	Managed for Resource	Managed for Resource	Managed for Resource
	Benefit	Benefit	Benefit	Benefit

<sup>\*</sup> Also counted as mechanical fuels acres; acres include fuel wood harvest program.

Table T.5: Recreation Management Activities That May Impact Species or Their Habitats over the Life of the

Land and Resource Management Plan for all Species (acres)

Recreation Opportunity	Alternative A	Alternative B	Alternative C	Alternative D			
Spectrum	-						
Summer Recreation Opportunity							
Rural	30,115	1,325	1,400	1,399			
Roaded natural	881,687	495,545	455,615	591,076			
Semi-primitive motorized	93,738	448,638	274,643	512,464			
Semi-primitive non-motorized	369,118	435,171	137,885	278,360			
Primitive	490,173	2,620	513,756	0			
Primitive wilderness	0	481,532	481,532	481,532			
	Winter Rec	reation Opportunity	7				
Rural	1,643	2,866	397	2,954			
Roaded natural	657,367	318,659	344,021	596,881			
Semi-primitive motorized	287,471	514,037	268,378	319,863			
Semi-primitive non-motorized	437,315	545,132	243,329	463,601			
Primitive	0	2,605	527,174	0			
Primitive wilderness	481,035	481,532	481,532	481,532			
Ski Areas							
Total acres of downhill ski	14,491	7,714	3,350	12,596			
areas							

Table T.6: Motorized Travel Land Allocations That May Impact Species or Their Habitats over the Life of

the Land and Resource Management Plan for all Species (acres)

Management Activity	Alternative A	Alternative B	Alternative C	Alternative D				
SJNF Motorized Travel Over Ground (acres)								
USFS not suitable	482,019	928,054	1,133,752	755,538				
USFS suitable	896,400	632,500	448,992	759,602				
USFS suitable	486,413	304,278	282,088	349,692				
opportunity areas								
SJNF Motorized Travel Over Snow (acres)								
USFS not suitable	980,860	1,072,520	1,277,808	1,008,741				
USFS suitable	883,972	792,312	587,024	856,091				

Table T.7: Livestock Grazing Land Allocations That May Impact Species or Their Habitats over the Life of

the Land and Resource Management Plan for all Species (acres)

	Alternative A	Alternative B	Alternative C	Alternative D					
	Livestock Grazing Acres Available on Active Allotments								
Sheep	183,733	183,733	122,670	183,733					
Cattle	689,628	689,628	641,456	800,810					
Livestock Grazing: Permitted Animal Unit Months									
Sheep	6,396	6,396	4,981	11,327					

<sup>\*\*</sup> Joint project with timber.

PC = Partial cut average acres, per year, over the life of the LRMP; Rest = Restoration harvest based on HRV; CC = Clearcut;

	Alternative A	Alternative B	Alternative C	Alternative D
Cattle	102,925	105,809	93,602	139,745

Table T.8: Oil and Gas Leasing Availability and Stipulations That May Impact Species or Their Habitats

over the Life of the Land and Resource Management Plan for all Species (acres)

	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing
					Alternative
Federal mineral acres	1,863,402	1,863,402	1,863,402	1,863,402	1,863,402
Acres available for leasing	1,337,090	1,279,811	709,335	1,338,551	0
% of federal minerals	71%	68%	38%	72%	N/A
Available for Leasing					
No surface occupancy	848,806	897,266	547,642	666,105	0
% of Available acres that are	46%	48%	29%	36%	N/A
no surface occupancy					
Timing limitation	783,302	527,489	157	45,463	0
Controlled surface use	513,893	882,532	391,150	1,033,242	0
Standard lease terms	177,162	143,722	129,069	210,570	0

Table T.9: Habitat Improvement Activities That May Impact Species or Their Habitats over the Life of the

Land and Resource Management Plan for all Species (acres)

	Alternative A	Alternative B	Alternative C	Alternative D
Riparian and watershed improvement	30 acres	150 acres	300 acres	150 acres
Nokomis fritillary butterfly habitat improvement and restoration	1 site	2 sites	2 sites	0 sites
Bat habitat restoration and protection via installation of structures associated with mine closures	All	All	All	All
Terrestrial wildlife habitat improvement and restoration	1,500 acres	2,000 acres	2,000 acres	1,500 acres
Ponderosa pine restoration to support associated wildlife populations	1,000 acres	3,000 acres	3,000 acres	2,000 acres
Cool-moist mixed conifer and spruce-fir restoration to support associated wildlife populations	1,000 acres	2,000 acres	2,000 acres	1,000 acres
Winter range habitat improvement for big game	1,500 acres	5,000 acres	2,500 acres	1,500 acres
Aspen restoration to support associated wildlife populations	1,000 acres	3,000 acres	3,000 acres	1,000 acres

#### 1.2 Species Evaluated

All sensitive species known to occur or suspected to have habitat on the SJNF are evaluated below (Table T.10). Sensitive species are from the Region 2 Regional Forester's sensitive species list that was updated on June 10, 2011. Species are grouped by mammals, birds, insects, amphibians, reptiles, fish, and plants. This information is based on the most current scientific information available including species assessments, monitoring plans, conservation assessments and plans, and recovery plans. The North American wolverine (*Gulo gulo luscus*) was proposed for listing on February 4, 2013.

Table T.10: U.S. Forest Service Sensitive Species and Habitat Associations for the San Juan National Forest

Table T.10: U.S. Forest Service Sensitive Species and Habitat Associations for the San Juan National Forest			
Sensitive Species	Habitat Association or Vegetation Type		
	Mammals (9)		
American marten	Subalpine spruce-fir forests, alpine tundra, montane forests		
Martes americana			
Fringed myotis	Pinyon-juniper and other coniferous woodlands		
Myotis thysanodes pahasapensis			
Gunnison's prairie dog	Grasslands and semi-desert and montane shrublands		
Cynomys gunnisoni			
Hoary bat	Associated with trees; in Colorado, it is mainly found in ponderosa pine,		
Lasiurus cinerus	pinyon-juniper, and riparian forest		
New Mexico meadow jumping mouse	Mesic grass/forb/sedge riparian habitat		
Zapus hudsonius luteus			
River otter	Stream and river riparian		
Lontra canadensis			
Rocky Mountain bighorn sheep	Steep, high mountain terrain dominated by grass, low shrubs, rock cover		
Ovis canadensis canadensis	and areas near open escape		
Spotted bat	Pinyon-juniper, shrub desert, possibly riparian		
Euderma maculatum			
Townsend's big-eared bat	Abandoned mines and caves		
Corynorhinus townsendii			
	Birds (18)		
American bald eagle	Forested stands around aquatic settings		
Haliaeetus americanus			
American bittern	Marsh, swamp, or bog with cattails, rushes, grasses, and sedges		
Botaurus lentiginosus			
American peregrine falcon	Breeds on cliffs, often in association with riparian areas; regular breeder		
Falco peregrinus anatum	on the SJNF		
Black swift	Vertical rock faces near waterfalls or in dripping caves		
Cypseloides niger			
Boreal owl	Mature spruce-fir forests with high canopy closure		
Aegolius funereus			
Brewer's sparrow	Primarily sagebrush but also in mixed shrublands (rabbitbrush,		
Spizella breweri	greasewood, etc.)		
Ferruginous hawk	Grasslands and semi-desert shrub; not known to breed but a regular		
Buteo regalis	winter resident on the SJNF		
Flammulated owl	Open ponderosa pine forests; dry montane conifer or aspen forests, often		
Otus flammeolus	with dense saplings		
Lewis' woodpecker	Open ponderosa pine forest, riparian, and pinyon-juniper woodlands		
Melanerpes lewis			
Loggerhead shrike	Lowland riparian, pinyon-juniper woodlands, semi-desert shrublands		
Lanius ludovicianus			
Northern goshawk	Ponderosa pine, aspen, mixed conifer, and spruce-fir forests		
Accipiter gentiles			
Northern harrier	Grasslands, agricultural lands, mountain sagebrush, and marshes;		
Circus cyaneus	requires abundant cover (same as for short-eared owl)		
Olive-sided flycatcher	Snags and conifers, often on steep slopes, open stands, and natural		
Contopus cooperi	openings		
Purple martin	Mature aspen stands near streams, springs, or ponds		
Progne subis			
Short-eared owl	Open habitats including grasslands, marsh edges, shrub-steppe, and		
Asio flammeus	agricultural lands; requires taller grass cover than northern harrier		

Sensitive Species	Habitat Association or Vegetation Type		
Western burrowing owl	Prairie dog colonies with vacant burrows; grasslands, shrublands,		
Athene cunicularia	deserts		
Western yellow-billed cuckoo	Riparian; gallery cottonwoods with dense understory		
Coccyzus americanus			
White-tailed ptarmigan	Alpine tundra, especially with rock fields and willow carrs		
Lagopus leucurus			
Insects (1)			
Great Basin silverspot butterfly (Nokomis fritillary butterfly)  Speyeria nokomis nokomis	Riparian; mostly tied to springs		
Amphibians (2)			
Boreal toad	Damp conditions; marshes, wet meadows, streams, ponds, lakes		
Bufo boreas boreas			
Northern leopard frog	Water's edge; wet meadows, banks of marshes and ponds		
Rana pipiens			

#### 1.2.1 Mammals

#### **American Marten**

#### Background

The American marten (Martes americana), also known as the pine marten or simply marten, is a carnivorous mammal roughly the size of a small house cat. It is a member of the weasel family (Mustelidae) and is one of seven species in the genus *Martes*. The only other member of the *Martes* group in North America is the fisher (M. pennanti), which is much larger and occurs in a much narrower geographic range than the marten. One subspecies occurs in Colorado (M. a. origenes) (Fitzgerald et al. 1994). Marten are primarily carnivores of small mammals and prey on a wide variety of species. They are somewhat opportunistic with the species taken and frequency of taking, which varies greatly geographically with availability (Martin 1994). The most important prey of marten in the Rocky Mountain West are red-backed voles (Myodes sp.), pine squirrels (Tamiasciurus sp.), and various species of Microtus. Other prey, include insects, birds, bird's eggs, and even fish. They also take carrion when available, especially during the winter (Strickland et al. 1982). During late summer and fall, soft mast is consumed, especially berries of Vaccinium and Rubrus (Buskirk and Ruggerio 1994). Changes in small mammal prey can affect the carrying capacity of marten habitat (Strickland et al. 1982). Food shortages have the greatest effect on females and juveniles due to their high energy requirements (Strickland et al. 1982). Martens mate in mid-summer, usually July or August. The female gives birth to young in dens, which are located in rock piles, beneath logs, in hollow logs, and beneath tree roots. Young are moved from natal sites to maternal sites after birth. They also use sites aboveground in large hollow trees lined with grass, moss, and leaves.

#### Status and Distribution

The marten is broadly distributed in North America. It extends from the spruce-fir forests of northern New Mexico to the northern limit of trees in arctic Alaska and Canada, and from the southern Sierra Nevada of California to Newfoundland Island. In Canada and Alaska, its distribution is vast and continuous, but in the western United States, its distribution is limited to mountain ranges that provide preferred habitat (Buskirk and Ruggiero 1994). The marten is primarily an inhabitant of upper montane to boreal forests in the western United States (Buskirk and Ruggiero 1994).

#### Habitat across the Species' Range

Marten have traditionally been considered to occupy a narrow range of habitat types. Some research suggests, however, that they are adaptable to a wide variety of forest habitats (Strickland et al. 1982). Even so, the species is closely associated with late-successional coniferous forest, especially those with complex physical ground structure (Buskirk and Ruggerio 1994). Marten prefer mesic forest conditions

and forest stands with xeric conditions, or those that lack structure near the ground, are seldom used (Buskirk and Ruggerio 1994) They appear to prefer overhead cover and avoid extensive use of open areas, particularly in winter (Bennett 1984). In the central and southern Rockies they are most often associated with spruce-fir or lodgepole pine (*Pinus contorta*) and are generally absent in stands of ponderosa (*P. ponderosa*) or pinyon pine (*P. edulis*). Marten have not been recorded to favor hardwood stands over conifer-dominated stands in any part of their entire range (Buskirk and Ruggerio 1994). In Colorado, the marten occurs in most coniferous forest in the higher mountains (Fitzgerald et al. 1994).

#### Habitat on the San Juan National Forest

Marten habitat occurs across the SJNF at the mid-upper elevational zones and spruce-fir forest types are considered primary habitat. Although they are most commonly observed in spruce-fir forests, marten are occasionally seen in lower elevation mixed conifer forests. Structural characteristics that are important in determining overall suitability include abundant and well-distributed coarse woody debris, canopy closures >30%, with 40% to 60% considered optimal. Mature spruce-fir forests with mesic understory conditions and large amounts of large-diameter downed woody material are important to marten because they provide key habitat components for their primary prey, southern red-back vole (*Myodes gapperi*) (Allen 1983) and red squirrel (*Tamiasciurus hudsonicus*) (Fitzgerald et al. 1994). Regular and widely distributed sightings of animals and tracks on the SJNF lead to the conclusion that martens are well distributed and reasonably abundant in suitable habitat on NFS lands of the SJNF.

#### **Primary Risk Factors**

Habitat is perhaps the most important limiting and controlling factor for marten populations, particularly loss of habitat components as it effects foraging, resting, breeding, and dispersal. Other limiting factors include fragmentation and geographic isolation, prey availability, low population density, low reproductive potential, predation, competing predators, trapping, weather, parasites and disease. Marten habitat use within their home range is much more limited during the winter months.

#### **Fringed Myotis**

#### **Background**

The fringed myotis (*Myotis thysanodes*) is a member of the large-eared group of North American myotis. The most distinctive characteristic of this species, as suggested by its common name, is a conspicuous fringe of stiff hairs that protrude along the trailing edge of the tail membrane (Adams 2003). The species is particularly susceptible to human disturbances, especially near maternity colonies (O'Farrell and Studier 1980, cited in Adams 2003). Hibernation has only been documented in buildings and underground mines (Bradley and Ports 2003). The species is known to migrate, but to what extent is unclear.

#### Status and Distribution

The fringed myotis ranges throughout western North America, from British Columbia southward into Mexico (Adams 2003). Records are scattered throughout the mountainous regions of the Rocky Mountain states. There appears to be a large distributional gap between southwest Utah and populations in north-central Idaho and west Montana.

#### Habitat across the Species' Range

Although oak and pinyon woodlands appear to be used commonly by this species, it also may be found abundant in fir-pine forests (Adams 2003). Fringed myotis roosts in crevices, in buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and snags, particularly large ones, is common throughout its range in the western United States and Canada. The fringed myotis roosts have been documented in a large variety of tree species and it is likely that structural characteristics (e.g., height, decay stage) rather than tree species play a greater role in selection of a snag or tree as a roost.

#### Habitat on the San Juan National Forest

In Colorado, the fringed myotis ranges across saxicoline brush and Douglas-fir (*Pseudotsuga menziesii*) forest on the eastern slope near Boulder and in pinyon-juniper and ponderosa pine woodlands in other parts of the state (Armstrong et al. 1994). Specific surveys for fringed myotis have not been conducted on the SJNF, but the species is expected to utilize mostly pinyon-juniper and other forested woodlands across the forest.

#### **Primary Risk Factors**

The greatest threat and limiting factor to this bat is thought to be human disturbance of roost sites and especially hibernacula and maternity colonies, through recreational caving and mine exploration (Arizona Game and Fish Department 1993; Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. It is likely that if White Nose Syndrome were found in Colorado this species may not be as impacted as cave-obligate species. Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, fuels treatments, timber harvest, and destruction of buildings and bridges used as roosts (Western Bat Working Group 1998). Disturbance or destruction of water sources and riparian habitat may also influence fringed myotis habitat use (NatureServe 2013).

#### **Gunnison's Prairie Dog**

#### Background

Gunnison's prairie dog (Cynomys gunnisoni) is one of five species of prairie dog, all of which are native to North America. Gunnison's prairie dog is a keystone species of the sagebrush ecosystem. They create habitat, provide food, and help keep the soil and plant communities healthy. For example, their abandoned burrows are used by burrowing owls (Athene cunicularia), weasels (Mustela sp.), snakes, badgers, and even foxes. The prairie dog is an important food source for coyote (Canis latrans), weasels, foxes, hawks, eagles, and the endangered black-footed ferret (Mustela nigripes). In addition, their burrowing helps to aerate the soil, add organic matter, and help to increase water penetration (U.S. Fish and Wildlife Service [USFWS] 2010), Gunnison's prairie dog feeds on grasses, forbs, sedges (Carex sp.). and shrubs. Insects are of minor importance to its diet. Flowers and other succulent parts of forbs and shrubs are also consumed but the animals do little digging for roots and tubers (Fitzgerald et al. 1994). The species is not known to store food in its burrow. As with all species of prairie dogs and most ground squirrels, they gather grasses and forbs for nesting materials, especially in late summer. Free water is not required (Fitzgerald et al. 1994). The species is generally found in groups of several individuals and oftentimes forming colonies. They dig burrows that are used for raising young and provide cover from predators. Gunnison's prairie dogs hibernate. In central Colorado around 10,000 feet in elevation, individuals enter burrows by October and emerge in mid-April. Hibernation periods at lower elevations are shorter and some individuals may even appear above ground in winter months (Raynor et al. 1987, cited in Fitzgerald et al. 1994). Predators include badgers (*Taxidea taxus*), golden eagles (*Aquila chrysaetos*), covotes, bobcats (Lvnx rufus), and red-tailed hawks (Buteo jamaicensis). In Colorado, prairie dogs are considered small game species and are provided no protection from harvest. Reproduction occurs May through mid-July.

#### Status and Distribution

Gunnison's prairie dogs are distributed from central Colorado to central Arizona, including southeast Utah and much of the northwest half of New Mexico (NatureServe 2013). In Colorado, the species is restricted to southwest and south-central Colorado. They range in elevation from 6,000 to 12,000 feet. They are well distributed across the SJNF at lower elevations.

#### Habitat across the Species' Range

Gunnison's prairie dogs inhabit grasslands and semi-desert and montane shrublands (Fitzgerald et al. 1994). Habitat use by Gunnison's prairie dogs differs somewhat from the black-tailed prairie dog (*Cynomys ludovicianus*) primarily due to the strikingly different geographical settings within the range distribution of these species. The black-tailed prairie dog is primarily a prairie species, while the

Gunnison's prairie dog is associated with intermountain valleys, benches, and plateaus that offer prairie-like topography and vegetation. These intermountain valleys, benches, and plateaus can range from very arid to mesic sites. Gunnison prairie dogs can occupy mesic plateaus and higher mountain valleys, as well as arid lowlands (Knowles, 2002).

#### Habitat on the San Juan National Forest

Habitat for Gunnison's prairie dog is found in grasslands and semi-desert and montane shrublands across the forest.

#### **Primary Risk Factors**

Of all the factors affecting Gunnison's prairie dog populations, sylvatic plague is the most significant. Recreational shooting and pest control continue to be a threat to the Gunnison's prairie dog throughout its range and contributes to the decline of the species when combined with the effects of disease. However, these threats are being monitored and managed. Agriculture, urbanization, roads, and oil and gas development each currently affect a small percentage of Gunnison's prairie dog habitat (USFWS 2008).

#### **Hoary Bat**

#### Background

The hoary bat (*Lasiurus cinereus*) is quite distinctive from any other bat in the Rocky Mountain states because of its large size and coloration. Hoary bats have mixed dark brownish grayish fur, tinged with white to produce a frosty or hoary effect. Hoary bats forage primarily over open areas, about treetops, and along streams and lake shores (Anderson 2002). They have a strong preference for moths, but are also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (Black 1972; Ross 1967). Individuals generally emerge late in the evening to feed (Shrump and Shrump 1982), but have also been seen flying on warm winter afternoons.

#### Status and Distribution

The hoary bat, a member of the Family Vespertilionidae, is the most widespread of all North American bats (Adams 2003). This species ranges from near the limit of trees in Canada, southward at least to Guatemala and from Brazil to Argentina and Chile. This species has been captured in all Rocky Mountain states (Adams 2003). In Colorado, individuals have been captured at elevations exceeding 9,000 feet and occur statewide from the plains to timberline (Armstrong et. al 1994). Males and females are segregated in the summer, males tending to stay in Colorado while females continue north to bear and rear young. In Colorado, males oversummer, but females are rare (Armstrong et al. 1994). Although hoary bats are thought to be highly migratory, wintering sites have not been well documented, and no specific migration routes have been discerned (Ellison et al. 2003).

#### Habitat across the Species' Range

Hoary bats are highly associated with forested habitats in the West (Ellison et al. 2003). The species appears to favor deciduous trees for roosts in the eastern United States, but in Colorado the species is frequently taken in ponderosa pine forest where large deciduous trees are lacking (Armstrong 1972; Ellinwood 1978). Hoary bats are solitary and roost primarily among the foliage of both coniferous and deciduous trees with good leaf cover near the end of branches 10 to 39 feet above the ground with a clear flight path below at edge of a clearing. Hoary bats have also been found to use unusual roost sites in caves, rock ledges, woodpecker holes, squirrel nests, under driftwood planks, and on the sides of buildings. The habitat use of hoary bats, particularly use of winter sites, is not well understood.

#### Habitat on the San Juan National Forest

Hoary bat are mostly associated with trees across the SJNF, mainly in ponderosa pine, pinyon-juniper, and riparian forest.

#### **Primary Risk Factors**

Loss of roosting habitat due to timber harvest is likely the biggest threat or limiting factor to this species. Data on hoary bat population trends are scarce; however, even in the absence of these data, there is strong evidence that this species is experiencing a downward population trend (USFS 2011a)2). Because of this species' dependence on trees with foliage for summer roosts, insect, disease and large-scale disturbances may also be a significant threat or limiting factor to hoary bat populations.

#### **New Mexico Meadow Jumping Mouse**

#### **Background**

The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) is one of three species of *Zapus* found in North America, This subspecies, *luteus*, is endemic to the American Southwest where it is known as disjunct Pleistocene relic populations (Frey 2008). In general, the meadow jumping mouse can be recognized as having large hind legs and hind feet, and having a tail accounting for a minimum of 60% of its total length (Fitzgerald et al. 1994). The subspecies is approximately 4.8 to 5.6 inches in length. Its habitat overlaps with the western jumping mouse (*Z. princeps*) generally found at higher elevations. Distinguishing between the meadow jumping mouse and western jumping mouse is difficult having a similar size and peliage (Frey 2005). The species emerges from hibernation in early summer where most foods are insects, with roughly 20% of its diet consisting of seeds. As the season progresses the percent of seed intake increases becoming the dominant dietary component along with some fruits, fungus, and invertebrates (Fitzgerald et al. 1994; Whitaker 1963). Reproductive activities begin shortly after emerging from hibernation and can result in more than one liter per season. The species reenters hibernation in late August to mid–September.

#### Status and Distribution

The subspecies is known to occur from sites in eastern Arizona, New Mexico, and extreme southern Colorado. The meadow jumping mouse is not currently known to occur on the SJNF. It has been found on private lands at lower elevations in general proximity to the SJNF.

#### Habitat across the Species' Range

This species is found in moist grasslands and meadows, often along the edges of marshes and near free-flowing water (Morrison 1990). In habitat studies by Frey in New Mexico, the species is restricted to complex riparian habitats. Very good habitat was deemed in those areas with very dense vegetation cover over 3 feet high, with grasses and forbs dominating the areas where the species was found (Frey 2005). Beaver dams and some human-made dams on streams can produce suitable habitat for this species in montane areas, particularly at the most upstream portion of the impoundment where sedimentation deposition and periodic inundation creates moist soil and conditions and herbaceous plant growth (Frey 2006).

#### Habitat on the San Juan National Forest

In the summer of 2010, a study was conducted to determine presence of this species on lands administered by the SJNF and San Luis Valley Public Lands Center in southwest Colorado. No individuals were captured (Frey 2011). These surveys were conducted by expert Jennifer Frey in the best habitat available on the SJNF, which is areas of mesic grass, forb, and sedge riparian habitat. Frey (2011) also suggests that that additional surveys should focus on areas with perennial streams, no (or very little) livestock grazing, and low elevation (below 7,611 feet).

#### **Primary Risk Factors**

The primary threat to this taxon is livestock grazing, which can dramatically alter the structure and composition of herbaceous riparian vegetation. Other identified threats include drought and climate change, urbanization, water development, recreation, forest fires, flooding, loss of beaver, and conversion of riparian habitat to agricultural crops (Frey 2011).

#### **River Otter**

#### **Background**

The river otter (*Lontra canadensis*) is an elongate, robust mustelid with a thick, tapering tail. River otters feed opportunistically on aquatic animals, particularly fishes (mostly slow-moving, mid-size species), frogs, crayfish, turtles, insects, etc., and sometimes birds and small mammals. When inactive, it occupies hollow logs, space under roots, logs or overhang, abandoned beaver lodges, dense thickets near water, or burrows of other animal; such sites also are used for rearing young. River otters may travel long distances overland, particularly in snow (NatureServe 2013).

#### Status and Distribution

The historic range of river otter is throughout most of North America north of Mexico, except the extreme southwestern United States and was extirpated from large areas of the interior United States following European colonization but has been reintroduced in some parts of the range (e.g., Colorado, Virginia) (NatureServe 2013). The species occurs in the Colorado, Gunnison, Piedra, and Dolores Rivers. Tracks and other sign of otters have also been found in the Poudre and Laramie drainages in Larimer County (Natural Diversity Information Source 2005).

#### Habitat across the Species' Range

The river otter inhabits streams, lakes, ponds, swamps, marshes, estuaries (in some areas), beaver flowages, and exposed outer coast (Pacific Northwest, Alaska) that traverse a variety of other ecosystems ranging from semi-desert shrublands to montane and subalpine forests. The species requires permanent water of relatively high quality and with an abundant food base of fish or crustaceans. Generally, streams of 10 cubic feet per second or higher are required to provide suitable habitat. Other habitat features that may be important include the presence of ice-free reaches of stream in winter, water depth, stream width, and suitable access to shoreline (Natural Diversity Information Source 2005).

#### Habitat on the San Juan National Forest

Thirteen river otters from Wisconsin were reintroduced into the Piedra River. Between 1988 and 1991, 28 river otters from Alaska, Oregon, and California were reintroduced in the Dolores River. Dolores River otters seem to be reproducing and are distributed from the Colorado state line to Rico and on the San Miguel River. During presence/absence surveys done in 2002 by the Colorado Department of Wildlife, the Piedra River otters were distributed through the Piedra River from Williams Reservoir to Navajo Reservoir. No otters were found on the Los Pinos River though reproduction was known to occur a few years previous. On the San Juan River, sign of one otter was sited. The Animas River and the Florida River are known to have otters but were not surveyed. No methods for estimating populations have been successfully developed, and therefore no estimates of population numbers have been made.

#### **Primary Risk Factors**

Principal threats are habitat destruction and degradation, and human-caused mortality. Habitat destruction and degradation include water development resulting in stream flow and channel morphology alteration, water pollution, loss of riparian vegetation, and human settlement and recreational use along rivers and lakes. Water development is a widespread and increasing threat in most watersheds across Region 2 and may affect river otter populations at local and regional scales. Increasing human settlement, with the resulting increases in water development and recreational use, is the most immediate threat to river otter population viability in many watersheds throughout Region 2. Water pollution is a localized threat in some mountain drainages streams in Colorado and Wyoming, and a more pervasive threat in lower stream reaches. Water pollution that reduces or eliminates otter prey populations (fish and invertebrates) is a threat at local scales to some otter populations or potential habitats (Boyle 2006).

#### **Rocky Mountain Bighorn Sheep**

#### **Background**

Bighorn sheep are ungulates native to North America in the Family Bovidae. They are characterized by low reproductive rates, long life spans, and populations adapted to live near carrying capacity in relatively stable environments (Geist 1971 in Beecham et al. 2007). Bighorn sheep are social animals that live in groups most of the year. Bighorn sheep have a high degree of site fidelity, which ties them closely to areas they are familiar with, and leads to slow rates of herd expansion. Such fidelity leads to vulnerability from increased stress levels when disturbances to their home range occur (Fitzgerald et al. 1994). During spring and summer, bighorns segregate by sex and age (Fitzgerald et al. 1994). In the southern Rocky Mountains, the peak breeding season occurs from about mid-November to mid-December (Beecham et al. 2007). Most young are born in May or June, peaking in mid-June (Fitzgerald et al. 1994). Escape terrain is critical for ewes during lambing to the extent they would sacrifice high-quality forage for security (Beecham et al. 2007).

#### Status and Distribution

Prior to the arrival of Euro-Americans in western North America, bighorn sheep occupied mountains and river canvons as far north as southern British Columbia and southwestern Alberta, south through the Rocky Mountains into northern New Mexico, and east into the badlands of North Dakota and the Black Hills of South Dakota and Nebraska (Beecham et al. 2007). Bighorn sheep are currently found in all western states and provinces with historical records from New Mexico to British Columbia. Although bighorn sheep numbers declined dramatically with the settling of the West and are currently at less than 10% of historic numbers, they are still considered somewhat secure throughout much of their range (NatureServe 2013). However, many regional sheep herds are vulnerable because they consist of small numbers (often less than 100 animals and many biologists consider herds with less than 200 animals at risk due to extrinsic factors), are isolated from adjacent sheep populations (sometimes by large expanses of unsuitable habitat), and are threatened by disease transmitted from domestic livestock (Berger 1990: Goodson 1994; Krausman et al. 1993; Wehausen 1999 in Beecham et al. 2007). Early accounts by trappers and explorers indicate bighorn sheep were common in Colorado prior to Euro-American settlement in the mid-1800s (Moser 1962 in George et al. 2009). Available evidence indicates bighorns were widely distributed and occupied suitable habitat across a range of elevations throughout the state. In 1915, there was a statewide estimate of 7,230 bighorn sheep, 3,200 in 1958, 2,200 in 1970, 6,045 in 1988, and 7.040 in 2007 (George et al. 2009). One reason for the apparent increase in Colorado's bighorn populations since the 1970s is a longstanding effort by CPW (formerly Colorado Division of Wildlife) to trap and translocate wild sheep for the purpose of establishing new bighorn populations or supplementing existing populations.

#### Habitat across the Species' Range

Bighorn sheep are adapted to a wide variety of habitats across western North America ranging in elevation sea level to over 14,100 feet. Current distribution is confined to scattered populations in open or semi-open, often precipitous, terrain characterized by a mix of steep or gentle slopes, broken cliffs, rock outcrops, and canyons and their adjacent river benches and mesa tops.

#### Habitat on the San Juan National Forest

In Colorado, mountain bighorn sheep prefer high visibility habitat dominated by grass, low shrubs, and rock cover, areas near open escape terrain, and topographic relief (Fitzgerald et al. 1994). All bighorn herds on the SJNF have increased over the past 20+ years. The 2011 post-hunt population estimates were 460 bighorns for the Weminuche Data Analysis Unit, 450 bighorns for San Juans West Data Analysis Unit, 210 bighorns for the South San Juans Data Analysis Unit, and 60 bighorns for the Animas River Data Analysis Unit.

#### **Primary Risk Factors**

There are several natural factors that could influence habitat conditions for bighorn sheep. However, a primary issue involves their high susceptibility to a wide variety of diseases and parasites, many of which

have been contracted from domestic sheep (Geist 1971). Limiting factors to bighorn sheep herds include deadly epizootics as a result of disease transmission from domestic goats and sheep and between bighorn herds during translocation projects: the loss of genetic variability in small herds; habitat deterioration, loss and fragmentation, human disturbance on critical winter and lambing ranges, and competition for forage and space with livestock and other ungulate species; and cougar predation on adult female sheep in remnant or recently reintroduced herds (Beecham et al. 2007). The risk of disease transmission is impossible to eliminate when bighorn and domestic sheep occupy the same range area because male bighorns are attracted to domestic ewes and/or they utilize the same foraging or watering areas. Contacts between wild and domestic sheep have frequently resulted in massive die-offs of bighorns that represent a loss of many years of costly efforts to restore the species to its former range. The loss of genetic diversity and herd memory of historical migration routes may also be irreplaceable when attempting to restore bighorns after a massive die-off. There have been no confirmed bighorn dieoff events on the SJNF. There is, however, strong circumstantial evidence a mortality event occurred in 1988 after observed close proximity and presumed physical contact between domestic sheep and a small number of transplanted bighorn sheep on NFS lands in the Vallecito Creek Herd S28, which is a subpopulation of the Weminuche Data Analysis Unit. None of the transplanted bighorn sheep were known to have survived their first winter season and a complete mortality event of the transplanted animals is assumed to have occurred. Although habitat degradation from fire suppression, highways, livestock grazing, and human disturbance is of concern, the susceptibility of Rocky Mountain bighorn sheep herds to extirpation as a result of diseases that may be transmitted by domestic sheep or goats appears to be the greatest threat.

#### **Spotted Bat**

#### Background

The spotted bat (*Euderma maculatum*) is a desert species that is currently known to occur sporadically on the far western portion of the SJNF. Foraging has been observed in forest openings, pinyon-juniper woodlands, large riverine/riparian habitats, riparian habitat associated with small to mid-sized streams in narrow canyons, wetlands, meadows, and agricultural fields (Western Bat Working Group 1998).

#### Status and Distribution

The spotted bat occurs from south-central British Columbia to southern Mexico. In Colorado, spotted bats occur in the western semi-desert canyonlands (Armstrong et al. 1994).

#### Habitat across the Species' Range

Spotted bats have been found in a variety of habitats; however, rocky cliffs are necessary to provide suitable cracks and crevices for roosting, as is access to water (Fitzgerald et al. 1994). The species roosts by day in rock crevices located on high cliffs (Watkins 1997, cited in Adams 2003). The dependency of rock-faced cliff roosting habitat limits the spotted bat to very small geographic areas with specific geologic features (Luce 2004).

#### Habitat on the San Juan National Forest

Spotted bats can be found in pinyon-juniper and shrub desert habitat, as well as some riparian areas across the SJNF.

#### **Primary Risk Factors**

The availability of suitable cliff roosting sites has been indicated as a primary limiting factor for the Spotted Bat (Pierson and Rainey 1998; Storz 1995). Pierson and Rainey (1998) also speculate that, due to the spotted bats' apparent preference for open habitats for foraging, its prey base might be sensitive to overgrazing by livestock. Historically, the spotted bat has endured little impact from human disturbance because its roosts are remote. Recreational rock climbing may disturb bats in local situations (Luce 2004). Large-scale pesticide programs to control Mormon crickets (*Anabrus simplex*) and grasshoppers could affect this species by reducing the availability of prey (Luce 2004). Disturbance to hibernacula in the winter months during temperature extremes could be limiting.

#### Townsend's big-eared bat

#### **Background**

Townsend's big-eared bat (*Corynorhinus townsendii*) falls within the genus *Corynorhinus* of which there are five species (Kunz and Martin 1982). There are five subspecies of *Corynorhinus townsendii*, two of which occur in the West, *C.t. townsendii* and *C.t. pallescens*. There appear to be extensive zones of intergradation, making it difficult to distinguish one from the other. The subspecies occurring in Colorado is *C.t. pallescens* (Pierson et al. 1999). The distinguishing characteristic of Townsend's big-eared bat, as the name implies, is the large size of its ears or pinnae, which serve primarily as auditory devices. However, based on the orientation of the ears in while flying, it has been suggested that these structures may also provide lift in flight (Pierson et al. 1999).

#### Status and Distribution

The Townsend's big-eared bat (*Corynorhinus townsendii*) occurs throughout much of western North America, with some isolated populations in the eastern United States (Adams 2003). The species occurs from near sea level in California (Adams 2003) to 9,500 feet in Colorado (Armstrong et al. 1994) and up to 10,400 feet in the White Mountains of Arizona (Pierson et al. 1999).

#### Habitat across the Species' Range

Biotic communities utilized by the species appear to vary geographically from arid plateaus in northern Mexico to primarily riparian communities in Kansas and Oklahoma (Kunz and Martin 1982). In New Mexico and Colorado (Armstrong et al. 1994) it appears to be more associated with mesic coniferous and deciduous forest and woodlands, as well as deciduous riparian woodland and semi-desert and montane shrubland. However, the physical characteristics of habitat are much more important to the species, especially the presence of caves or mines, which provide maternal roosts, hibernacula in winter, as and day and night roosting opportunities for males and non-breeding females (Armstrong et al. 1994). Townsend's big-eared bat is a cave-dwelling species that has adapted to a variety of human-made structures, most commonly mines (Pierson et al. 1999). It has also been found in abandoned buildings with cave-like attics, water diversion tunnels, and bridges. The most critical sites for this species appear to be the winter hibernacula, which are used by both sexes, and the summer maternity roosts used by the adult females and their young (Pierson et al. 1999). Townsend's big-eared bat does not normally share these roosts with other species. In the non-winter months males and non-reproductive females have day roost, night roost, and interim roost used before young are born in the spring or in fall before hibernation (Pierson et al. 1999). Physical habitat, especially the presence of caves or mines suitable for day and night roosting and for hibernation, is probably more important than the vegetative characteristics (Armstrong et al. 1994). Roosting habitats consist most frequently of caves and abandoned mines, but also include buildings, bridges, rock crevices, and hollow trees.

#### Habitat on the San Juan National Forest

Although natural caves are not abundant on the SJNF, considerable habitat is available for Townsend's big-eared bat in the numerous abandoned mines left from historic mining. These mines are not evenly distributed across the forest but tend to be concentrated in certain areas, such as Silverton and La Plata Canyon. Most of these sites tend to occur at higher elevations (>9,000 feet). Surveys performed at mines on Bureau of Land Management (BLM) lands near the Dolores River Canyon have identified several occupied sites at elevations as low as 7,700 feet (Navo et al. 2001). One of the largest winter roost sites in Colorado was found in the early 1990s at a patented mine on the Mancos-Dolores District of the SJNF. Colorado Department of Wildlife (CDOW, now CPW) biologists currently monitor the site. Elsewhere, CDOW volunteers conducted exit counts and trapped bats at various abandoned mines in La Plata Canyon during the early 1990s. No Townsend's big-eared bats were recorded during these surveys, nor have there been any other confirmed reports of this species elsewhere on the SJNF.

#### **Primary Risk Factors**

The primary threat from land use plan decisions are disturbance or destruction of roost sites caused by recreational caving, mine reclamation, and renewed mining in historical districts. This species is sensitive

to disturbance and has been documented to abandon roost sites after human visitation. Disturbance to hibernacula in the winter months during temperature extremes may be critical. Both roosting and foraging habitats may be affected by timber harvest practices. In addition, pesticide spraying in forested and agricultural areas may affect the prey base (Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. Townsend's big-eared bats are cave obligate species and introduction of White Nose Syndrome into their environment could be detrimental to populations in Colorado.

#### 1.2.2 Birds

#### **American Bald Eagle**

#### **Background**

The bald eagle (*Haliaeetus leucocephalus*) is a large bird of prey with a wingspan of approximately 6 to 7 feet. It is brown in color except for the white head and tail. Bald eagles feed primarily on fish they catch or take from other fish eating birds. They will feed on waterfowl and other birds, carrion, small to medium-sized mammals, and turtles. Although the bald eagle is an opportunistic feeder, preying on a wide variety of food sources, it has a strong preference for fish (Buehler 2000). Bald eagles will feed on big game animals that have died on their winter ranges. This carrion provides an important source of food during the winter. Waterfowl, particularly dead or crippled individuals, are an important source of food when fish are not readily available (USFWS 1998).

#### Status and Distribution

Found throughout the United States and Canada primarily near large bodies of water or larger streams and rivers. The winter range of the bald eagle includes most of its breeding range; however, most eagles winter from southern Alaska south to Arizona, New Mexico, and Colorado (USFWS 1998).

#### Habitat across the Species' Range

Breeding habitat is typically associated with water but actual distance to water varies within and among populations (Buehler 2000). Nesting occurs wherever adequate fish are available. Bald eagles exhibit a strong territorial and nest site fidelity and breeding areas are often reused in successive years. Therefore, its breeding and winter habitat is typically (but not always) associated with aqueous environments including rivers, large reservoirs, natural lakes, and ocean shoreline. It is also typically associated with forested habitats in proximity to these water environments for nesting, perching, and roosting (Buehler 2000). Bald eagles are generally considered sensitive to human disturbance and most often choose breeding and roost sites some distance from disturbance regimes. However, individuals and populations exhibit a wide range of sensitivity to disturbance, as indicated by flushing studies (Buehler 2000). Colorado serves primarily as winter habitat for the bald eagle but a small, though apparently increasing, number of nesters have been reported in recent years (Winternitz 1998). In Colorado nest sites are located most commonly along rivers, reservoirs, and natural lakes, and have been documented between roughly 4,500 and 8,500 feet in elevation (Andrews and Righter 1992; Winternitz 1998).

#### Habitat on the San Juan National Forest

On the SJNF there have been several confirmed nest sites within the forest boundary. Some potential nesting lakes on the SJNF include McPhee Reservoir, Lemon Reservoir, Electra Lake, Williams Creek Reservoir, and Vallecito Reservoir. The larger rivers on the SJNF including the San Juan, Piedra, Los Piños, and Animas all have the potential to contain bald eagle nests now or could provide future nesting habitat. Both the larger lakes/reservoirs and rivers on NFS lands provide fall, winter, and spring habitat for migrating bald eagles.

#### **Primary Risk Factors**

Food availability is the single most important factor affecting winter eagle distribution (USFWS 1998). Loss of habitat and prey sources could reduce populations. The bald eagle is also susceptible to poaching and human disturbance during nesting. The species is recovering from habitat degradation and

pesticide related problems. Bald eagles, like the peregrine falcon (*Falco peregrinus*) are very sensitive to disturbance from the initiation of courtship to young fledging. This time period is roughly from mid-December to mid or late June. During this time period it is extremely sensitive to human disturbance activities and nest abandonment and desertion of long established territories may occur.

#### **American Bittern**

#### Background

The American bittern (*Botaurus lentiginosus*) is a solitary bird that occupies and breeds in freshwater wetlands throughout the middle and northern portion of the United States. It stalks wetlands for its most common foods, which are generally any small animal found in a marsh. These include insects, frogs, fish, snakes, meadow mice, and salamanders (Gibbs and Reid 1992; Yaeger 1998). Bitterns are generally secretive and difficult to find and observe (British Columbia Ministry of Environment 1998; Yaeger 1998). Little is known about this species (Yanishevsky and Petring-Rupp 1998), perhaps, due to its obscure nature (Yaeger 1998). Its most distinctive feature is its call, which has a thumping, "eerie, ventriloquistic quality" (Gibbs and Reid 1992). It is brown, medium-sized, with a robust body, thick long neck, and short legs (Cramp and Simmons 1977; Hancock and Kushlan 1984 in Gibbs and Reid 1992).

#### Status and Distribution

The American bittern breeds in freshwater wetlands throughout the middle and northern portion of the United States and most of Canada, wintering in the southern United States and Mexico (Gibbs and Reid 1992). Its breeding range is from the southern Northwest Territories, concentrates in Canada, and extends south through the Great Plains through northern Utah, Nevada, and south-central California. On the East Coast of the United States it extends from Maine to South Carolina (National Geographic Society 1987 in Dechant et al. 2001a). It is not common in Colorado (less than five documented sightings per year as noted by Dechant et al. 2001a), and due to lack of overall data on this species and perhaps because of its secretive nature, accurate population distribution is difficult to substantiate.

#### Habitat across the Species' Range

American bitterns prefer the edges of freshwater shorelines with tall, emergent vegetation (Gibbs and Reid 1992; Yanishevsky and Petring-Rupp 1998). Throughout their breeding habitat and migratory range, they prefer marshes and wetlands. They have been found in wetlands of all sizes ranging from 0.1 to 1,000 hectares (Gibbs and Reid 1992), but they prefer larger wetlands (Gibbs and Reid 1992) and tend to prefer shallow water, less than approximately 4 inches, so that they can stand (Yanishevsky and Petring-Rupp 1998). Foraging habitat is often vegetation fringes and shorelines, and stands of older, dense, or dry vegetation are seemingly avoided (Gibbs and Reid 1992).

#### Habitat on the San Juan National Forest

The SJNF has performed no formal surveys for this species, but it is considered rare here. In 1988 the Durango Bird Club (Andrews and Righter 1992) noted the American bittern was reported to have nested at Durango in La Plata County, but has rarely been observed. Unconfirmed vocalizations were detected on two separate occasions in 2000 in the wetlands below Turtle Lake in the Falls Creek area on the Columbine District.

#### **Primary Risk Factors**

The primary limiting factor for American bittern in Region 2 appears to be loss of breeding habitat, primarily through draining and conversion of wetlands for agricultural use. In addition, agricultural use of adjoining upland grasslands, human disturbance at breeding sites, degradation of habitat by grazing livestock, siltation, eutrophication, and contamination of water supplies with herbicides may all be having detrimental effects on bitterns (Wiggins 2006). The loss of wetlands disrupts breeding grounds and foraging habitat. Reduced size of wetlands also substantially alters habitat because the American bittern prefers large wetlands to small ones (Gibbs and Reid 1992) and habitats that are not isolated from other wetland habitats (Dechant etal. 2001a). The main cause of population declines has undoubtedly been the loss of habitat (Dechant etal. 2001a). Habitat fragmentation, pollution, and degradation can result in

habitat loss. Other factors may include weather, nest predation, nest parasitism, human disturbance, and hunting.

#### **American Peregrine Falcon**

#### Background

The peregrine falcon is a grayish, medium-sized raptor with characteristics common to most other falcons, including a conspicuously toothed and notched bill, pointed wings, and narrow tail. The male approximates the size of an American crow (*Corvus brachyrhynchos*) while the female is more comparable in size to the common raven (*Corvus corax*) (Oregon State University 2001). It is distinguished from the similarly sized prairie falcon (*Falco mexicanus*) by its typically slate gray color and its heavy "sideburns" or "moustache," as well as its uniformly barred and spotted light underbody and wings (Peterson 1990). The species was nearly extirpated from the state of Colorado in the late 1970s, but has since to recovered to more than 100 known breeding pairs. There are approximately 14 breeding pairs known to occur on or near the SJNF, with many of these sites having been continually occupied since the mid-1980s. Peregrine falcons are primarily aerial hunters of a wide variety of avian species (USFWS 1977). Although small to medium-sized passerines make up the primary diet of peregrines, they may also occasionally take larger prey such as waterfowl (NatureServe 2013). In addition to avian prey, peregrines may rarely take small mammals, such as bats and small rodents, and even lizards (NatureServe 2013). Young recently out of the nest may occasionally prey on insects, and migrating falcons are often observed catching and eating migrating dragonflies.

#### Status and Distribution

The peregrine falcon breeds on every continent excluding Antarctica (Craig 1986; Hickey 1969). The three subspecies occurring in North America occupy relatively distinct geographical regions. The North American tundra species (*Falco peregrinus tundruis*) breeds in the arctic tundra then migrates as far as Argentina during the winter (Craig 1986). *F.p. pealei* resides in the Pacific coastal regions from the Aleutian Islands to northern Washington. This subspecies is generally non-migratory during the winter. *F.p. anatum* (that found on the SJNF) has the most extensive breeding range of the subspecies in North American, extending from the taiga south through the eastern and western United States to northern Mexico. Its historic breeding range excludes the central and extreme southeast portion of the United States, as well as much of central Canada.

#### Habitat across the Species' Range

In the western United States, breeding grounds for the peregrine falcon most commonly occur in mountainous areas near water sources (USFWS 1977). Peregrines prefer sites within 1,300 to 2,300 feet of perennial or ephemeral water (Pagel 1995). The preference for water features in proximity to nest sites is probably associated with the peregrine's prey base (Johnsgard 1990). Cliff structures are most often chosen for nest sites and cliffs are the only sites known in Colorado, but ground nesting has been commonly documented in most arctic areas. The peregrine hunts over a variety of habitat types and uses large hunting territories, extending to a radius of 12 to 18 miles from its nest site (Craig 1986). However, its hunting range is often skewed to favor watercourses (Towry 1984). Preferred hunting habitats include meadows and large open parks, river bottoms, marshes, lakes, cropland, and other features that attract abundant bird life (USFWS 1977). Foraging habitat often includes lookout perches on cliffs or tall trees and snags (Craig 1986).

#### Habitat on the San Juan National Forest

On the SJNF and throughout Colorado, breeding territories are found almost exclusively on high walls of tall cliffs in river gorges and along mountainsides (Craig 1986). Suitable breeding habitat for the peregrine falcon is present on all districts of the SJNF, and occupied sites occur on nearly all the major drainages (Dolores, Animas, Pine, Piedra, and San Juan Rivers). Breeding sites on the SJNF are usually occupied March through August. Typical nesting locations in Colorado range from 4,500 to 9,000 feet (Colorado Partners in Flight 2000) but on the SJNF exceed 10,500 feet at several sites. A definite preference is noted for south-facing, inaccessible cliffs with multiple ledges, which are used for nesting, roosting,

eating, and food transfer (USFWS 1977). The preference for a southern exposure tends to increase with increasing latitude (USFWS 1977). Vertical rise on cliff faces generally exceed 100 feet with typical cliffs ranging between 200 to 300 feet (USFWS 1977), but on the SJNF cliff faces average greater than 300 feet and exceed 600 feet at a number of sites. Preferred cliffs generally rise high above the adjacent landscape and offer a good vantage point for prey and predators.

#### **Primary Risk Factors**

Limiting factors include limited suitable nesting habitat, prey availability, fragmentation of hunting territories, limited recruitment of young into the population, weather, predation, competition, sensitivity to pesticides, parasites and disease, and sensitivity to human disturbance.

#### **Black Swift**

#### Background

The black swift (*Cypseloides niger*) is the single representative of the nine species in the genus *Cypeseloides* to occur north of Sinaloa, Mexico (Chantler and Driessens 1995). This species has the unique characteristic of nesting in colonies on cliffs in close association with mountain waterfalls, often within the spray zone of rushing water. Although this species was first identified in Colorado in 1881 near Silverton (Knorr 1961), breeding in the state was not confirmed until 1949 (Knorr and Baily 1950). Breeding occurs June through mid-September.

#### Status and Distribution

The black swift is sparsely distributed in isolated colonies over western North America with Colorado populations representing a relatively large proportion of the known world population for this species (Boyle 1998a). The black swift is a neotropical migrant ranging as far south as Columbia during its winter migration (Stiles and Negret 1994). They have been observed roosting in Columbia in a steep river gorge in which swifts, in loose intraspecific colonies, clung to cliff walls overlooking the river (Stiles and Negret 1994).

#### Habitat across the Species' Range

Although the black swift primarily occurs in mountain regions in its continental range it has also been identified in the western coastal cliff regions on the Pacific in California (Chantler and Driessens 1995). In its mountainous habitats it forages over a range of habitats but is highly specific in its breeding site preference. Nest sites are almost always located on precipitous cliffs near or behind waterfalls (Hunter and Baldwin 1962; Knorr 1961). Knorr (1961, 1993) identified six requirements of nesting habitat for this species:

- Water: Black swifts nest in close proximity to water varying in degree from a rushing torrent to a mere trickle, although the former seems to be preferred. Nests are placed within the spray zone or directly behind sheets of falling water (Knorr 1961:).
- **High Relief:** Nest sites have a commanding position above surrounding terrain enabling birds to automatically attain feeding altitude by flying out of nest horizontally.
- **Inaccessibility:** Nests are almost always inaccessible to terrestrial predators.
- **Darkness:** Nests are almost always placed in positions where the sun rarely shines directly upon it. Additionally, nests are typically placed in darker recesses if available.
- **Unobstructed Flyways:** Black swifts appear to choose sites, which allow them to fly to and from the nest without flying through a "maze" of branches.
- Presence of Niches in Rock for Nests: Apparently sites with rock that offer no pockets, crannies, ledges, or shelves for nest placement appear to be avoided.
- Moss Availability: Black swifts build their nest primarily from mosses that grow in the wet environments around the nesting site (Knorr 1993).

Nest sites range in elevation from sea level in California to roughly 11,000 feet in Colorado (Bailey and Niedrach 1965) and occur within a wide range of surrounding habitats. During foraging activities the black

swift ranges at high elevation over most montane and adjacent lowland habitats (Andrews and Righter 1992). Foraging often occurs far from nesting areas (Boyle 1998a).

#### Habitat on the San Juan National Forest

The SJNF has identified 46 potential or occupied nesting sites on waterfalls across the SJNF. Within Colorado, the San Juan Mountains have been identified as having the most concentrated occurrences of black swift.

## **Primary Risk Factors**

Limiting factors include changes to microsite characteristics of suitable breeding habitat, small colony size, small clutch size, low regional populations, reproductive success, predation, human harassment, and pesticides.

#### **Boreal Owl**

## Background

The boreal owl (Aegolius funereus) is a small forest owl found in boreal and subalpine forest habitats. There are seven recognized subspecies of boreal owl, one of which occurs in North America (A.f. richardsoni). Although it has been well studied in Scandinavia, where it is the most abundant forest owl, its biology in North America has been less thoroughly examined (Hayward and Hayward 1993). Based on the limited studies performed to date in North America it appears that the biology and ecology of this species varies geographically and is strongly related to local forest conditions. Therefore, the more extensive Scandinavian studies on this species may not be directly applicable to North American populations. Due to its secretive behavior and to a general lack of survey effort this species was considered rare to uncommon in the mountains of Colorado until relatively recently (Andrews and Righter 1992: Yanishevsky and Petring-Rupp 1998: Palmer 1986) and was not confirmed on the SJNF until 1993 (Schultz 1996a). However, recent investigations may indicate that the species is more prevalent than previously thought within the state and within this portion of the state (Holland and Schultz 1993, 1994; Palmer 1986; Shultz 1996). Prey is primarily small mammals, especially the red-backed vole, which makes up 25% to 50% of their diet (Hayward and Hayward 1989). They are opportunistic hunters, and their summer diet is varied, including insects, jumping mice, chipmunks, birds, pocket gophers, shrews, deer mice, and voles.

#### Status and Distribution

In North America, the boreal owl is a year-round resident through Canada's boreal forest from the Yukon to Newfoundland. Scattered populations occur in northern Minnesota, the Cascade ranges, and south in the Rocky Mountains into north-central New Mexico (Ryder 1998). In the Rocky Mountains, Blue Mountains, and Cascade ranges they are restricted to subalpine forests (Hayward and Hayward 1993).

## Habitat across the Species' Range

In the Rocky Mountains the boreal owl is most closely associated with dense, mature, and late successional (>150 years) coniferous forest (Ryder 1998). This association with older forests may be at least partly due to the presence of available nest cavities. It appears to prefer mature and old growth spruce-fir forests but is also known to occasionally frequent lodgepole pine, Douglas fir, and aspen (*Populus* sp.) forests and may migrate to other lower elevational forest types during periods of nomadism (Hayward 1997; Palmer 1986; Ryder 1998). In Colorado, this species also exhibits a strong preference for mature spruce-fir forest over other forest types (Palmer 1986; Schultz 1996a). Owls in the state are generally found above 8,856 feet in elevation (Palmer 1986; Ryder et al. 1987). Breeding locations are most often found above 10,000 feet (Palmer 1986).

## Habitat on the San Juan National Forest

Studies on the SJNF and Grand Mesa, Uncompandere, and Gunnison National Forests (Holland and Schultz 1993; Schultz 1996a) suggest that mature spruce-fir forests are preferred breeding habitat for

local populations of boreal owls in southwest Colorado. However, in this and other regions, younger stands and mature aspen may occasionally be used if cavities are present (Hayward and Hayward 1993; Schultz 2001). In a 6-year census study in Colorado, Palmer and Ryder (1984 in Palmer 1986) found that active territories were most often located in high elevation forests (9,100–10,800 feet) and that lower elevational mixed forest (presumably below 9,000 feet) were only used during years of owl abundance. Their study suggests that high elevational spruce-fir provides optimum habitat and that individuals radiate outward from the center of best adaptation only when more optimal habitat niches are filled (Palmer 1986). Owls do not appear to roost in cavities, but instead rest on limbs near the bole of the tree. Roost trees in Idaho and Colorado appear to be almost exclusively conifers (Hayward et al. 1993; Palmer 1986). The affinity of the boreal owl in Colorado to closed canopy mature subalpine spruce-fir forest may be a direct relationship to its preferred prey (southern red-backed vole), which also occurs at its highest density in the state within similar forest habitats (Schultz 1996a).

## **Primary Risk Factors**

Thermal stress likely limits the elevational distribution of this species (Hayward 1997). Therefore, the availability of cool microsites, which often occur in mature forests may be a significant limiting factor in some regions (Hayward 1997). The boreal owl is vulnerable to predation by several species. American marten is probably the most important predator at the nest, preying on both owlets and nesting females (Hayward and Hayward 1993). Winter and spring are critical time periods for boreal owl survival and annual productivity. Overwinter survival is an important factor in determining population abundance, and female body condition in spring is correlated with female reproductive output the following summer (Hayward et al. 1993). Currently within the planning area, insect and disease activity is increasing due to drought and forest stand conditions that are unnaturally dense and old because of fire suppression and past management practices. However, the ongoing spruce beetle (Dendroctonus rufipennis) outbreak that started in 1996 has killed most of the overstory and midstory Engelmann spruce across an estimated 130,000 acres on the eastern side of the SJNF.) Spruce-fir habitat on the forest impacted by the spruce beetle epidemic may be a limiting factor to boreal owl and availability of prey as canopy cover decreases and trees die off. Studies in North America and Europe indicate that owl productivity and population demographics (clutch size, hatching rate, fledging rate, number of breeding pairs, adult survival) are directly related to prey availability (Hayward and Verner 1994). Hayward (1997:) concludes that cavity availability and prey availability likely interact to influence boreal owl population growth. Tree cavities occur non-randomly across the landscape, as do small mammal populations. The spatial arrangement of cavities and prey (relative to one another) are important in determining boreal owl abundance. The conservation status of boreal owls will be intimately tied to the interaction of these resources.

#### **Brewer's Sparrow**

#### Background

Brewer's sparrow (*Spizella breweri*) is an obligate of sagebrush (*Artemisia* sp.) communities (Braun et al. 1976; Paige and Ritter 1999). Brewer's sparrow is a species of conservation concern across much of its western range because of declines in sagebrush habitat and breeding populations. In spring and summer Brewer's sparrow consumes many insects (e.g., alfalfa weevils, aphids, beet leafhoppers, caterpillars, beetles). In fall and winter it feeds on seeds. Brewer's sparrows forage mainly on the ground. They drink free water when available and will bathe in standing water, but they are adapted to arid environments and can physiologically adjust to water deprivation, obtaining water from foods (Dawson et al. 1979; Rotenberry et al. 1999).

#### Status and Distribution

Brewer's sparrow is concentrated in the Great Basin from the eastern half of Washington and southern British Columbia to southwestern Saskatchewan (Smith 1996), and most of Montana, except portions of the northwest and northeast of the state. It is also found in the southern sections of Idaho through eastern Oregon, eastern California, and the northern sections of the Mojave Desert (Small 1994). This subspecies extends through all of Nevada, Utah, Wyoming, northern Arizona, northwestern New Mexico, and western, central, and eastern Colorado (Andrews and Righter 1992; Hubbard 1978).

# Habitat across the Species' Range

Throughout most of the species' breeding range, it is most closely associated with landscapes dominated by big sagebrush (*Artemisia tridentata*) (Rotenberry et al. 1999; Wiens and Rotenberry 1981) with an average canopy height of less than 5 feet (Rotenberry et al. 1999). It also occurs in shrubby openings in pinyon-juniper and mountain mahogany (*Cercocarpus spp.*) woodlands (Sedgwick 1987) and large shrubby parklands within coniferous forests (Rotenberry et al. 1999). Sagebrush in Colorado occurs at elevations of approximately 4,000 to 10,000 feet and exists in a variety of climatic conditions, including low-elevation semi-desert habitats and moist, cool, mountainous areas. Perhaps 30% of Colorado's sagebrush was altered between 1900 and 1974 (Braun et al. 1976), and the ecological integrity of Colorado's sagebrush shrublands has been compromised by the invasion of exotic (e.g., cheatgrass [*Bromus tectorum*]) or native (e.g., pinyon-juniper) plant species, conversion to agricultural, residential, and other developed land types, and changes in natural fire regimes (Beidleman 2000).

#### Habitat on the San Juan National Forest

Brewer's sparrow is thought to occur in the suitable lower elevation sagebrush types on NFS lands of the SJNF. Indication of abundance is unknown at present.

## **Primary Risk Factors**

The declines in Brewer's sparrow breeding populations are likely linked to extensive alteration of sagebrush shrub steppe habitats. Though widespread, this habitat constitutes one of the most endangered ecosystems in North America due to extensive, ecologically transformative influences of livestock grazing, followed by alteration of natural fire regimes and invasion by exotic plant species, especially cheatgrass. Threats and limiting factors for Brewer's sparrow are habitat loss and fragmentation, agriculture, prescribed burning in sagebrush habitat, oil and gas development, and livestock grazing.

# Ferruginous Hawk

# Background

The ferruginous hawk (*Buteo regalis*) is the largest of all North American buteos, typically 23 inches in length, with males weighing approximately 1,000 grams and females typically 1.3 times larger than the males (Preston 1998). As the name suggests, typical adults have reddish brown upper parts with a white patch at base of primaries (Preston 1998). This species inhabits open terrain such as grasslands and semi-desert shrublands and feeds almost exclusively on medium-sized mammals found in these habitats (Bechard and Schmutz 1995).

#### Status and Distribution

The breeding range of the ferruginous hawk is the smallest of any North American buteo (Preston 1998) with nesting activity identified in only 17 states and three provinces in Canada (Bechard and Schmutz 1995). The species winters primarily from the central and southern parts of breeding range south to Mexico. In Colorado it is a fairly common to common winter resident on eastern plains and uncommon to rare in western valleys and mountain parks (Andrews and Righter 1992; Preston 1998). It is an uncommon fall and winter resident in southwest Colorado (Durango Bird Club 1992). The SJNF is out of the breeding portion of the species range (NatureServe 2013). Overwintering on the SJNF occurs, but is considered uncommon to rare in this portion of the species' range.

# Habitat across the Species' Range

Ferruginous hawks primarily inhabit grasslands and semi-desert shrublands, and are rare in pinyon-juniper woodlands (Andrews and Righter 1992; Preston 1998). This species nests in trees and bushes, and on ledges, large rocks, riverbanks, and hillsides (Dechant et al. 2003; Finch 1992). Ferruginous hawks forage on native grasslands where nest sites are scarce, and as a consequence, individuals reuse nest sites until the structures are sometimes over 3 feet in height. Ferruginous hawks hunt from a perch, while soaring, during low, rapid flight over open country, or while systematically searching and hovering at

40 to 60 feet (Dechant et al. 2003; Finch 1992). They feed primarily on rabbits, ground squirrels, and prairie dogs, but will also take mice, rats, gophers, birds, snakes, locusts, and crickets (Dechant et al. 2003).

#### Habitat on the San Juan National Forest

On the SJNF, its occurrence during the non-breeding season is limited to more open areas that are suitable for hunting, and that contain sufficient densities of small mammal prey, such as prairie dogs and ground squirrels, during snow-free seasons. Fall and spring (i.e., during snow-free periods of the non-breeding season) are the most likely time periods this hawk might occur on the SJNF.

## **Primary Risk Factors**

Limiting factors for ferruginous hawks are nest site and prey availability (Dechant et al. 2003), habitat loss, predation, and human disturbance.

#### Flammulated Owl

## Background

The flammulated owl (*Otus flammeolus*) is perhaps the most common raptor in montane pine forests of the western United States (McCallum 1994). It is a tiny obligate secondary cavity nester that is entirely insectivorous (McCallum et al. 1994). Flammulated owls appear to be opportunistic insectivores (McCallum et al. 1994). During cold spring and early summer nights, the owls feed almost entirely on insects, adult lepidoptera such as noctuids (Reynolds and Linkhart 1992). Noctuids are large cold-hardy moths that are abundant in spring and fall (McCallum et al. 1994). As summer progresses and other arthropods become available, lepidopteran larvae, grasshoppers, spiders, crickets, and beetles are added to their diet (McCallum et al. 1994).

#### Status and Distribution

The flammulated owl a western mountain species that breeds locally from southern British Columbia, southern Idaho, and northern Colorado south to southern California, southern Arizona, southern New Mexico, western Texas, and from Mexico south to Guatemala (DeGraaf et al. 1991; Hayward and Verner 1994). It is a Neotropical migrant that winters in Mexico, casually north to southern California (DeGraaf et al. 1991). In Colorado, the flammulated owl is an uncommon to common summer resident in foothills and lower mountains, and is most common in western and southern Colorado (Winn 1998).

## Habitat across the Species' Range

Flammulated owl depends on tree cavities for nesting, open forests for catching insects, and brush or dense foliage for roosting (Winn 1998). They are associated with mature/old growth ponderosa pine and mixed conifer, and mature aspen (Reynolds and Linkhart 1992; Winn 1998). As an obligate secondary cavity nester, the species depends on the presence of snags and decaying trees of sufficient diameter to contain nest cavities and the presence of woodpeckers to construct suitable nest cavities. Male foraging, territorial defense, resting, and day roosting were restricted to a home range that averages 33 acres (Reynolds and Linkhart 1987). Flammulated owls forage intensively near the nest, and open vegetation is preferred for foraging (Reynolds and Linkhart 1987). In contrast to foraging habitat, which includes numerous interior edges, preferred roosting habitat appears to be dense vegetation (McCallum et al. 1994).

#### Habitat on the San Juan National Forest

Even though flammulated owls apparently use and breed in a variety of habitats, a review of the recent literature seems to indicate a strong preference for older ponderosa pine and warm dry mixed conifer sites containing older forest structures. Additionally, specific factors, particularly snag densities or cavity availability, would be necessary components determining suitable habitat. Flammulated owl have been found and confirmed to nest on all ranger districts on the SJNF and appear to be reasonably abundant

and widespread on the SJNF during the breeding season. This species shows very high fidelity to breeding sites in Colorado (Reynolds and Linkhart 1987, 1992).

## **Primary Risk Factors**

The flammulated owl, though widespread and locally abundant, is a habitat specialist with low and unvarying fertility (McCallum et al. 1994). Its range and abundance are functions of the range and abundance of its preferred habitat, not its own ecological amplitude or adaptability. Limited availability of suitable nest cavities and fragmentation of habitat may act as limiting factors for this species.

## Lewis' Woodpecker

## Background

Lewis' woodpecker (*Melanerpes lewis*) has unique characteristics that set it apart from other North American woodpeckers. It is opportunistic in its feeding habits, eating mostly insects in summer and switching in winter to acorns and other nuts, which are cached during the non-winter months (Abele et al. 2004; Bock 1970; Tobalske 1997). It is adept at capturing insects aerially through a variety of complex maneuvers, and, although it may glean from the surfaces and crevices of tree bark, it seldom excavates for wood-boring insects (Abele et al. 2004; Bock 1970; Tobalske 1997).

## Status and Distribution

Lewis' woodpecker breeds from southern British Columbia to southwestern South Dakota and northwestern Nebraska south to south-central California, central Arizona, southern New Mexico, and eastern Colorado. In Colorado, the Lewis' woodpecker breeds in foothills, valleys, plains and mesas in the southern part of the state, and along the front range from Wyoming to New Mexico It winters from northern Oregon, southern Idaho, central Colorado, and south-central Nebraska south irregularly to northern Baja California, northern Mexico, southern New Mexico, and west Texas (DeGraaf et al. 1991).

# Habitat across the Species' Range

Bock (1970) described the major breeding habitat of the Lewis' woodpecker as ponderosa pine throughout its range. However, they are now found in riparian habitats at a higher frequency than in upland conifer and woodland habitats (Kuenning 1998). Some researchers have suggested an elevational relationship in which ponderosa pine forests are preferred at higher elevations and open riparian forests at low elevations (Tobalske 1997). Canopy closures of 30% are considered optimal for this species and closures greater than 75% are considered unsuitable (Yanishevsky and Petring-Rupp 1998). Nest sites are associated with the presence of abundant free-living insects, open canopy forests or tree clusters, standing dead trees, and dense ground cover in the form of downed material, grasses, and shrubs (Abele et al. 2004; Tobalske 1997). Burned ponderosa pine forest may represent ideal habitat for nesting, although suitability may vary with numbers of years after fire and the intensity of the burn (Bock 1970; Linder 1994; Raphael and White 1984). Snags are important to the Lewis' woodpecker as nesting sites and as perching sites from which to hawk insect prey. Populations are positively correlated with snag density and at least one living or dead snag/acre is required to maintain fully occupied territories (Yanishevsky and Petring-Rupp 1998). A shrub crown cover of 50% is considered optimal and habitat featuring no shrub cover is considered unsuitable (Yanishevsky and Petring-Rupp 1998). The shrub component is apparently significant in providing an abundance of insect prev. However, shrubby understories appear to be of less importance in riparian areas and oak woodlands (Yanishevsky and Petring-Rupp 1998).

#### Habitat on the San Juan National Forest

Although Lewis' woodpecker uses a variety of habitats that are found on the SJNF, primary habitats are open, mature ponderosa pine and deciduous riparian woodland (cottonwood/box elder [*Populus/Acer negundo*]) communities during the breeding season, and mature oak woodlands during the non-breeding season (Schultz 1996b). In eastern Colorado, it inhabits cottonwood communities in close proximity to ponderosa pine or pinyon-juniper woodlands (Andrews and Righter 1992; Kuenning 1998; Yanishevsky and Petring-Rupp 1998). It seems to be especially common in the Durango area and La Plata County

(Andrews and Righter 1992). The Durango Bird Club (1992) considers this species a common year-round resident in southwest Colorado. This species occurs on all districts of the SJNF and is relatively common and locally abundant in suitable habitats across the SJNF (Schultz 1996b).

## **Primary Risk Factors**

Lewis' woodpecker requires specific structures and characteristics in its habitat, including relatively high snag densities with well decomposed snags to provide existing cavities or in which to construct new cavities. Their restricted ability to construct cavities may be a limiting factor of nest-site availability in some populations (Abele et al. 2004). They also require low-medium crown closures, well-developed shrub cover to supply insect prey, mast and berries, and caching sites. Broad-scale population declines and reductions in distribution have been attributed to declining availability of suitable trees for nesting and mast storage (Tobalske 1997). Competition for native mast may regulate wintering populations (Abele et al. 2004). Reductions in primary habitat have occurred through the loss of mature stands of ponderosa pine and in declining stands of riparian cottonwood forests. Most of the ponderosa pine forest type on the SJNF is outside its HRV from fire suppression, grazing, logging, and snag removal or loss (Romme et al. 1997). The availability of burned forests, which appear to be important habitat for this species, has probably declined as a result of fire suppression. Cottonwood riparian habitats, which serve as both breeding and wintering habitat, have also declined through grazing, clearing for pasture and agriculture, exotic shrub invasion, and water diversion (Abele et al. 2004; Tobalske 1997). They are competitive with the European starling (Sturnus vulgaris) for nest sites and high rates of territorial encounters with starlings may reduce reproductive success, even if the woodpecker dominates the interaction (Tobalske 1997). The most critical time period on the SJNF is likely to be during winter for overwinter survival.

## Loggerhead Shrike

## Background

The loggerhead shrike (*Lanius ludovicianus*) is a small avian predator that inhabits open country with scattered or clustered shrubs or small trees. It occupies a distinctive position in avian communities by preying on reptiles, mammals, and other birds, as well as invertebrates. The shrike has adapted to the problem of eating large prey by hunting from perches and impaling its prey on sharp objects. The diet of the loggerhead shrike is composed mostly of insects (83%), with the remainder made up of small mammals, birds, and reptiles. Sometimes it hawks for aerial insects, but it takes most of its prey as it dives to the ground from elevated perches such as fence posts or utility lines (Dechant et al. 2001b). It may pursue birds in rapid, sustained flight, knocking them to the ground with a blow from the beak (DeGraaf et al. 1991). They nest earlier than most other passerines. Nests are bulky, cup-shaped, and located in trees or large shrubs 3 to 30 feet high (DeGraaf et al. 1991). Nests are well below the crown in a crotch or large branch and are typically well hidden.

## Status and Distribution

The loggerhead shrike occurs across the United States, from central Washington, the Canadian prairies and Virginia in the north, to the southern states and central plains (except for heavily forested higher mountains and higher portions of the desert) (Yosef 1996). The southern range extends to Baja California and Mexico, at elevations of 4,920 to 7,880 feet. The southern states and central plains, not including eastern Colorado, support the highest densities (Carter 1998a). The northern populations are migratory, whereas the southern populations tend to be resident (Yosef 1996). They winter from Nevada and Virginia to southern Mexico. Despite its wide distribution, the loggerhead shrike is one of the few North American passerines whose populations have declined continent-wide in recent decades (Yosef 1996). In Colorado, there are distinct concentrations of loggerhead shrikes in the eastern portion of the state, and a few breeding pairs in isolated pockets in the south-central, western, and northwestern regions of the state (Carter 1998a). Populations on the Colorado's eastern plains appear to be increasing, but those on the western slope may be declining (Carter 1998a).

# Habitat across the Species' Range

Loggerhead shrikes prefer open habitat characterized by grasses interspersed with bare ground and shrubs or low trees for nesting and perching (Dechant et al. 2001b). Non-breeding habitat is the more open country from prairies and agricultural lands to montane meadows. Nesting habitat includes sagebrush, desert scrub, pinyon-juniper woodlands, and woodland edges (Dechant et al. 2001b). Breeding birds are usually near isolated trees or large shrubs.

#### Habitat on the San Juan National Forest

No shrike nests have been documented on NFS lands of the SJNF and suitable breeding habitat appears to be rare on the SJNF. It is unlikely to winter on the SJNF due to normally deep snows and lack of prey. The nesting season (May through August) is the most critical time period on the SJNF as they are absent during late fall, winter and early spring.

# **Primary Risk Factors**

Habitat loss is considered to be a major limiting factor of shrike populations throughout the United States (Carter 1998a; Yanishevsky and Petring-Rupp 1998). Conversions of grasslands to agricultural land, removal of trees or hedgerows, and urbanization are also limiting factors and have significantly reduced nesting and foraging habitat. Food limitation resulting in brood reduction (cannibalism) has been observed in shrikes, leading to suggestions that food limits reproductive output in some populations (Yosef 1996).

#### **Northern Goshawk**

# **Background**

The northern goshawk (*Accipiter gentiles*) is large-bodied raptor that is holarctic in distribution, meaning it is limited to northern hemispheres. Goshawks prey primarily on medium-sized forest birds and mammals. The majority of the important prey species reside mainly on the ground and in the lower portions of the tree canopy (Reynolds et al. 1992). Frequently noted prey species include a wide variety of small mammal and bird species.

#### Status and Distribution

In North America, it occurs from central California, Arizona, northern New Mexico, north and northeast through New Mexico, Colorado, and South Dakota east across the southern Lake States and south into the Appalachian Mountains to North Carolina (Braun et al. 1996; Kennedy 2003). In Colorado, the northern goshawk is considered an uncommon resident in foothills and mountains within the western portion of the state (Andrews and Righter 1992; Barrett 1998a). It is considered to be a winter resident throughout its range, but some individuals winter outside their breeding areas and undertake short-distance migrations (Kennedy 2003).

## Habitat across the Species' Range

Reynolds et al. (1992) consider the northern goshawk a forest generalist because it occurs in all major forest types (coniferous, deciduous, and mixed). Mature forest structures appear to be an important component in the goshawks nesting home range. It has been noted, however, that the goshawk seldom uses young dense forests. Researchers suggest that the reasons for avoidance of these areas may be due to insufficient space in and below the canopy to facilitate flight and prey capture. Additionally, due to the absence of larger trees, these areas would offer few opportunities for nesting. Goshawks exhibit high breeding territory fidelity from year to year (Kennedy 2003). All montane forest types are used for nesting (Barrett 1998a; Kennedy 2003). Nest areas have a relatively high tree canopy cover and a high density of large trees. Nests are typically located on shallow slopes with northerly exposures or in drainages or canyon bottoms protected by such slopes and are usually within close proximity to water (Barrett 1998a; Reynolds et al. 1992). Nest trees are often the largest trees in the stand and are frequently situated adjacent to breaks in the canopy such as old logging trails or openings created by fallen trees (Hennessy 1978; Kennedy 2003; Reynolds et al. 1992; Shuster 1980). Shuster (1980) also noted a relatively low level of understory vegetation in the general area of the nest site. Goshawks may select nest sites based

on stand structural features, then select an appropriate nest tree (Kennedy 2003). Winter habitat use by goshawks is described as "a variety of vegetation types, such as forests, woodlands, shrub lands, and forested riparian strips" (Kennedy 2003:64)..

#### Habitat on the San Juan National Forest

Breeding territories have been found on all ranger districts/field offices of the SJNF and in all forested habitat types. Foraging individuals are regularly seen in a wide variety of habitat types across the SJNF.

## **Primary Risk Factors**

There are a number of factors cited by researchers and managers as potentially detrimental to current and future goshawk viability. These include, but may not be limited to, habitat alteration, direct human disturbance, pesticides and other contaminants, and harvest for falconry. However, the primary concern throughout the range of the goshawk is habitat alteration due to timber and fire management practices. Additionally, the recent alterations of habitat due to insects and diseases in Colorado has changed goshawk habitat across the state. Prey availability and predation limit goshawk reproduction and recruitment (Kennedy 2003). Density-dependent territoriality may regulate population growth rate (Kennedy 2003). Prey availability affect populations in at least two different ways. First, low prey availability can reduce reproductive output or cause total nest failure (Boal and Mannan 1994). Low prey availability may also result in larger territories, thereby limiting the total number of territories within a given landscape of suitable habitat (Crocker-Bedford 1998; Kennedy et al. 1994). Clonal aspen stands within ponderosa pine and other conifer forest types are often used for nesting and may be important areas for foraging due to higher concentrations and diversity of prey species (Joy 1990; Shuster 1994). Aspen inclusions within pine and conifer forest types used for nesting by goshawks have been lost from the SJNF because of stand aging and lack of disturbance or subsequent regeneration due to fire suppression, and in some cases, browsing by domestic and native ungulates. During winter, prey abundance and not habitat per se may be an important factor in determining goshawk habitat use (Kennedy 2003). The nesting season (April-August) is likely to be the most critical time period and the most vulnerable to disturbance for goshawks on the SJNF.

## **Northern Harrier**

## Background

The northern harrier (*Circus cyaneus*) is a slender, medium-sized raptor with long wings and a long tail, and slender legs (MacWhirter and Bildstein 1996). The northern harrier is distinguished from other raptors by its low, coursing flight, and its distinctive, narrow wings, slim tail, and white rump patch (MacWhirter and Bildstein 1996). Voles and other small rodents, captured on the ground after a short pounce, are the primary prey of northern harriers. Harriers also prey on other mammals, small birds, reptiles, amphibians and large insects (Bildstein and Gollop 1988).

#### Status and Distribution

Northern harriers breed throughout North America and parts of Eurasia, but reach their highest densities in North America in the prairie-pothole region of the United States and Canada (Carter 1998b; Dechant et al. 2002; Price et al. 1995). Northern harriers reside throughout most of Colorado, but are usually more abundant during migration than during the breeding season (Andrews and Righter 1992).

# Habitat across the Species' Range

Harriers prefer open habitats with tall, dense vegetation, and abundant residual vegetation, wetlands, wet or dry grasslands, lightly grazed pastures, croplands and fallow fields, brushy areas, and dry shrublands (Dechant et al. 2002; Hamerstrom 1986). Breeding northern harriers require large tracts (greater than 100 ha) of habitat. In late summer, they forage up to alpine tundra (Carter 1998b). They breed in a variety of open habitats with tall cover from marshes to grasslands, such as cattail and reed marshes, emergent wetlands, grasslands, and tall desert shrublands (Carter 1998b; Dechant et al. 2002; Hamerstrom 1986). Whether nesting in dry upland or wetland habitats, harriers appear to be associated with large tracts of undisturbed habitat (MacWhirter and Bildstein 1996).

## Habitat on the San Juan National Forest

Northern harrier are seen occasionally in summer on the NFS lands of the SJNF and may breed in some large open parks and wetlands; however, very few of these types of habitats are present on the forest.

## **Primary Risk Factors**

Harrier populations have been difficult to monitor because of their relatively low density and shift breeding sites in response to prey availability. Nevertheless, there is substantial evidence that populations have declined, significantly in some locations, and these declines are primarily attributed to habitat loss, habitat fragmentation, and degradation of breeding and non-breeding habitat (MacWhirter and Bildstein 1996). Intensive grazing, annual burning, tilling, or mowing in harrier nesting habitat during the nesting season can significantly reduce harrier nest success and prevent successful nesting in some areas (Dechant et al. 2002). However, periodic disturbance, such as burning every 3 to 5 years, or light to moderate grazing may help maintain habitat for harrier nesting and their primary small mammal prey (Bock et al. 1993; Hands et al. 1989). Harriers declined in the 1970s due to effects of insecticides, but declines have continued, probably due to loss of wetlands and conversion of grassland breeding habitats to agricultural uses (Carter 1998b).

# Olive-sided Flycatcher

## Background

The olive-sided flycatcher (*Contopus cooperi*) is one of the most recognizable bird species of North America's coniferous forests due to its distinctive song (quick, three beers) and its habit of singing from tall, prominent perches (Altman and Sallabanks 2000). Due to their foraging strategy, which involves sallying for insects from high perches, they prefer the edges of open habitats that provide both abundant prey and high visibility for detecting prey (Altman 1997). Almost all food captured are flying insects taken in aerial pursuit by sallying from and returning to the same or another prominent perch (Altman 1997). Bees, wasps, honeybees, flying ants, and dragonflies make up a high percentage of diet during the breeding season (Altman 1997; Wright 1997). Other reported prey includes flies (Diptera), beetles, grasshoppers, true bugs, and moths (Altman and Sallabanks 2000). The olive-sided flycatcher returns to its breeding habitat in the southern Rocky Mountains in May, initiates pair bonds, and begins actively building nests by late May or early June (S.L. Jones 1998). They construct open cup nests that are often placed well out on the tip of a horizontal branch most often in coniferous trees.

#### Status and Distribution

The olive-sided flycatcher is a neotropical migrant, with most of its breeding range in North America and its wintering grounds in Central and South America. There has been a significant population decline of about 3.5% per year since 1966 across its entire North American breeding range, amounting to a loss of about three-quarters of the population over the 30-year span (Sauer et al. 2004). Within its breeding range, which includes the western mountains of the United States, much of Canada and Alaska, and scattered populations in the eastern United States, it is primarily an inhabitant of coniferous forest (Altman and Sallabanks 2000). The western North America breeding range extends south from south-central Alaska eastward through Canada to north-central Manitoba. It extends south in the Rocky Mountains to the higher elevations of northeastern Arizona, northern New Mexico, and western Texas, and the Sierra Nevada south to northern Baja California (Altman 1997). The species is a well distributed and relatively common breeding bird throughout montane portions of western Colorado (S.L. Jones 1998).

# Habitat across the Species' Range

Olive-sided flycatcher breeding habitat has two primary components, snags for singing and foraging perches, and conifers for nesting. Flycatcher territories almost always include natural forest openings, bogs, beaver ponds, wetlands, steams, riparian areas, streams, lake shores, or old burned and logged areas (S.L. Jones 1998). Hutto (1995) and Altman (1999) suggest that flycatchers have evolved as early post-fire dependent species and that managed forest may represent an ecological sink. The nest is typically located in live conifers, although deciduous trees (i.e., aspen) may be used in some areas. Territory sizes are highly variable but generally large for a passerine bird with pairs well-spaced apart

(Altman 1997). Initial habitat groups developed for the Monitoring Colorado's Birds Program (Leukering et al. 2000) placed the olive-sided flycatcher in with other Colorado species that had their highest detection rates in aspen. Monitoring information for 2000, however, recorded the highest densities in high-elevation riparian habitat (Leukering et al. 2001). These detections coincide with natural openings and edges near riparian zones in the spruce-fir land type and indicate a habitat relationship similar to that described in the Colorado Landbird Conservation Plan (Beidleman 2000). Monitoring information for 2001 varied again and found the highest detections in ponderosa pine, mixed conifer, and spruce-fir, respectively (Leukering et al. 2002). This information suggests that the olive-sided flycatcher uses a wide variety of habitats in Colorado but is most commonly found in high to mid-elevation coniferous forests.

#### Habitat on the San Juan National Forest

On NFS lands of the SJNF, olive-sided flycatchers are most commonly found in spruce-fir forests and ponderosa pine forests where there is a significant remaining component of pre-settlement trees or supercanopy snags. They are found less commonly in mixed conifer and aspen forests. The nesting season (May–August) is the most critical time period for flycatchers on the SJNF because they are absent from the SJNF during fall, winter, and early spring.

## **Primary Risk Factors**

The causes for this species range-wide decline are not well known (Altman and Sallabanks 2000). Suppression of forest fires and expansion of dense second-growth forests are likely limiting factors, along with habitat loss along migratory routes and in wintering areas of Central and South America which could contribute significantly to population declines (Nature Conservancy 2005). The extirpation and recovery of beaver populations throughout most of the western United States between the mid-nineteenth through late-twentieth centuries likely had a significant effect on flycatchers due to their strong association with beaver pond habitats. Fire suppression throughout its breeding range undoubtedly limits the acreage of available habitat (Altman 1997). Deforestation on this bird's Central and South American wintering grounds has been speculated to be a significant threat to species conservation, possibly explaining why field observers report this bird to be disappearing from apparently suitable and unchanged breeding areas with long histories of occupancy (Altman and Sallabanks 2000). Local information suggests that olivesided flycatchers on the SJNF are most commonly associated with spruce-fir forest types, particularly near forest edges adjacent to riparian habitat. They should also be expected in past wildfire areas, particularly where an available snag component remains. As a result of the spruce beetle epidemic that has affected the forest over the last decade, ample snag habitat is available for this species in areas affected by the insect.

## **Purple Martin**

## Background

The purple martin is the largest North American swallow and one of the largest swallows worldwide (Brown 1997). There are three subspecies of purple martin. The local subspecies found on NFS lands of the SJNF is presumably *P.s. arboricola*. Eastern populations of the purple martin have recently shifted breeding to artificial nest structures and are popular and well known for their use of backyard birdhouses. However, western populations continue to nest in their traditional habitats (Brown 1997). Purple martin was first identified as breeding in Colorado in 1872 but the next confirmed breeding record did not occur until 1978 on the SJNF at Stoner Mesa (Levad 1998). Since that time breeding colonies have been identified across the Western Slope (Levad 1998). Adults arrived in breeding areas by early June and flocked in preparation for departure by late August. Nests may be found in mature aspen stands. Diet varies widely across the geographic range of the species with insect availability. Insects found in their diet common to Colorado include a variety of beetles, wasps and bees, dragonflies, caddisflies, mayflies, a variety of moths and butterflies, and winged termites (Brown 1997).

#### Status and Distribution

Purple marten breeds in the southern and central Rocky Mountains, including the interior highlands of Central Mexico, and may include populations found along the coastal regions of the Pacific Northwest to

southern British Columbia (Brown 1997). In Colorado, Andrews and Righter (1992) consider purple martin a common summer resident in the lower mountains of northeastern Mesa and Delta, and northwestern Gunnison Counties. They consider the species rare to uncommon breeders north to Moffat and Routt Counties, east to Pitkin County and south to Montezuma, La Plata and Archuleta Counties.

## Habitat across the Species' Range

Breeding habitat for the purple martin varies greatly among populations depending on geographical location. As mentioned previously, eastern populations now nest predominantly in artificial nest structures and have become highly urbanized, probably as a result of lost habitat resulting from deforestation in this portion of its range (Brown 1997). Desert populations nest in cavities of saguaro cactus (*Carnegiea gigantea*), as well as cliffs (Brown 1997; Levad 1998). However, in Colorado, breeding habitat is found almost exclusively in mature aspen stands (Levad 1998; Reynolds et.al., 2002; Svoboda et al. 1980). Breeding site elevations reported by Gillihan and Levad (2002) range between 7,900 and 9,800 feet (n = 82) and from Levad (1998) range from 8,000 to 9,000 feet. Purple martins appear to have moderately high level of site fidelity, and colony sites and specific cavities are reoccupied in successive years (Brown 1997). Although aspen forest is the typical breeding habitat for this species, it also may be found in mixed aspen/ponderosa pine or aspen/Douglas-fir forests (Andrews and Righter 1992). Nests are more frequently found in live aspen rather than in snags and in cavities excavated by northern flickers (*Colaptes auratus*) (Reynolds et al. 1991). Nests are usually within 1,000 feet of water, which includes small creeks and stock ponds. During migration, martins occur over riparian areas, open agricultural areas, and reservoirs.

#### Habitat on the San Juan National Forest

Inventory and monitoring for purple martins has occurred on the Mancos-Dolores Ranger District. Historically, only three purple martin sites are known from the Mancos-Dolores Ranger District, and currently there are 10 site records of recently active colonies. Martins may be found in suitable habitat on the Columbine and Pagosa Ranger Districts but limited time has been invested surveying for the species. Surveys that have occurred were conducted for specific projects to determine presence or absence, and no populations have been reported to date.

## **Primary Risk Factors**

Due to the specific nest-site requirements, habitat is probably one of the most significant limiting factors for the purple martin in Colorado. Aspen makes up a very small percentage of the overall vegetation on the forest (approximately 13%), and mature aspen is an even small percentage of those total acres. Loss of mature aspen stands with parklands and water sources nearby could reduce the availability of suitable habitat for purple martins. Other limiting factors include disease, reproductive success, weather, parasites, competition with other species, and threats on winter grounds.

#### **Short-eared Owl**

#### **Background**

The short-eared owl (*Asio flammeus*) is a small to medium-sized owl with long wings (Cramp 1985), and light wing-loading (Clark 1975). Short-eared owls primarily eat rodents (commonly *Microtus spp.*) but also take other small mammals, birds (especially in coastal areas), and insects (Terres 1980). Short-eared owls forage primarily by flying low, typically into wind, and dropping down onto prey, sometimes after brief hover. Sibling cannibalism may occur.

#### Status and Distribution

The short-eared owl is a widespread breeding species in the north-temperate and arctic regions, southern and northwestern South America, and many isolated island groups (e.g., Hawaii, Galapagos, Iceland). In North America, they breed in open habitats throughout most arctic and temperate areas and south into the central portions of the United States ranging from northern Alaska to northern Labrador, south to California, Utah, Colorado, Missouri, Illinois, Ohio, and Virginia. Non-breeding habitat occurs mostly from

the southern parts of most Canadian provinces south to southern Baja California, southern Mexico, Gulf Coast, Florida (American Ornithologists' Union 1983).

# Habitat across the Species' Range

In North America, short-eared owls nest in open habitats including grasslands, sagebrush, marshes, and tundra. Recently published nesting records within Region 2 suggest that typical habitat is Conservation Reserve Program grasslands in Kansas (five nests) (Busby and Zimmerman 2001) and South Dakota (two nests) (Peterson 1995), and inter-mountain and prairie grasslands, as well as marshy areas in Colorado (four nests) (Boyle 1998b). No recent nesting records (e.g., Molhoff 2001) exist for Nebraska, but nesting habitat there is likely similar to that in Kansas and South Dakota. Unpublished nest records from Arapaho National Wildlife Reserve in north-central Colorado show that short-eared owls sometimes nest in sagebrush areas immediately adjacent to wet meadows and grasslands (Bilbeisi, personal communication 2003). Descriptions of nest sites in North Dakota and South Dakota suggested that short-eared owls preferred areas with 30 to 60 cm high vegetation, in fields with 2 to 8 years of residual vegetation build-up (Duebbert and Lokemoen 1977). Further east, preferred nesting habitat in Wisconsin was grasslands with maximum vegetation heights of 28 to 36 inches (Evrard et al. 1991), and in Illinois managed grasslands were 12 to 16 inches tall (Herkert et al. 1999). In general, short-eared owls breed and winter in relatively dense grasslands, especially those associated with water, but their numbers and location vary strongly from year to year.

#### Habitat on the San Juan National Forest

Historically in Colorado, short-eared owls were noted primarily in winter, with only a few reports of nesting. However, nesting records slowly accumulated during the mid1900s, and Bailey and Niedrach (1965) noted it as an uncommon resident, with most nesting records on the eastern plains. Recent breeding records are mostly from the northeastern quarter of the state, along with isolated breeding in North Park (Arapaho National Wildlife Reserve), the San Luis River valley (Monte Vista and Alamosa National Wildlife Reserves), and an isolated breeding record in the Southwest (Andrews and Righter 1992; Boyle 1998b). Andrews and Righter (1992) and Boyle (1998) stressed the sporadic nature of nesting at specific localities. Occurrence on NFS lands of the SJNF is considered rare to incidental. No nesting has been documented on the SJNF.

#### **Primary Risk Factors**

Habitat loss is considered the biggest limiting factor for short-eared owls. The species is declining in many parts of the range due to destruction and degradation of marshes, grasslands, and low-use pastures (Ehrlich et al. 1992). Populations have declined due to reforestation of farmlands and fragmentation and development of coastal grasslands (see Holt 1992). Loss of open grasslands to later successional stages of community development reduces available hunting and breeding habitat. Other limiting factors include predation, prey abundance, human harassment including shooting, and collision with vehicles and structures (NatureServe 2013). In winter the ground roosting habit may be abandoned for trees, possibly in response to deep snow (Banfield 1947; Bosakowski 1986).

## **Western Burrowing Owl**

#### **Background**

The western burrowing owl is a medium-sized ground-dwelling inhabitant of western grasslands and deserts. It has several unique physical and behavioral characteristics in relation to other North American owls. It has long legs and an unusually short tail. It has tendency to nest in loose colonies in underground burrows, which is not only unusual for owls but is quite rare in any other avian species. Although it is primarily nocturnal, it is also quite active during the day, especially during the breeding season.

#### Status and Distribution

The burrowing owl breeds from south-central British Columbia eastward to southern Saskatchewan and south through much of the western United States, Mexico, and Central and South America to southern Chile (S.R. Jones 1998). Isolated populations are found in central Florida and on several Caribbean

islands including Cuba, Hispanola, Lesser Antilles, Antigua, and the Bahamas (Haug et al. 1993). In Colorado, it is a locally uncommon to fairly common summer resident on the eastern plains, uncommon in the Grande Valley in Mesa County and rare to uncommon in other western valleys and mountain parks. It is considered a casual winter resident on the eastern plains (Andrews and Righter 1992).

## Habitat across the Species' Range

The burrowing owl uses grasslands and mountain parks, usually in or near prairie dog towns (Andrews and Righter 1992). They also use well-drained steppes, deserts, prairies and agricultural lands (Haug et al. 1993). Semi-desert shrublands are rarely used (Andrews and Righter 1992). Openness, short vegetation, and burrow availability are essential components of habitat (Yanishevsky and Petring-Rupp 1998). The presence of a nest burrow seems to be a primary requirement for habitat suitability (Haug 1985). Burrows of prairie dog and ground squirrel are used most frequently, but badger burrows are also used. In Colorado, owls generally select their burrows in areas with other burrows surrounded by bare ground (S.R. Jones 1998). They often use burrows located within active prairie dog communities and in areas where prairie dog colonies have become inactive owls would discontinue their use when grass reaches 6 inches in height (S.R. Jones 1998). The family occasionally uses the surrounding burrows as alternate roosts and escape cover after the young leave the nest. They frequently choose sites close to roads (Plumpton 1992). This owl occasionally becomes urbanized and will breed or forage in vacant areas within urban zones. Little is known about the habitat preferences for migrating owls in their winter habitats (Haug et al. 1993).

#### Habitat on the San Juan National Forest

NFS lands of the SJNF are not considered breeding habitat for the burrowing owl although prairie dog habitat is present. There are no known occurrences on any district of the SJNF and there are no known breeding records on the SJNF (Schultz, personal communication 2012).

# **Primary Risk Factors**

Habitat loss is considered to be a major factor limiting burrowing owl populations in the western United States (Yanishevsky and Petring-Rupp 1998). Declining populations of prairie dogs colonies, as a result of control programs and plague, have resulted in a reduction in suitable nest areas. Conversion of grasslands to intensive agriculture and urbanization has also had impacts on available burrow habitats. Other limiting factors include low recruitment of juveniles, predation, prey availability, parasites, weather, shooting, vehicle collisions, and pesticides.

#### Yellow-billed Cuckoo

#### Status and Distribution

Two subspecies of yellow-billed cuckoo (*Coccyzus americanus*) were recognized by the American Ornithologists' Union (1957), with *C.a. americanus* east of the Rocky Mountains and *C.a. occidentalis* westward. The yellow-billed cuckoo eats mainly caterpillars, as well as other insects, some fruits, sometimes small lizards and frogs, and bird eggs (Terres 1980). The species gleans food from branches or foliage, or sallies from a perch to catch prey on the wing (Ehrlich et al. 1992).

#### Status and Distribution

Historically, yellow-billed cuckoos bred throughout most of continental North America, including portions of eastern and western Canada, northern and central Mexico, and the Greater Antilles. The species is now extirpated in western Canada, Washington, and Oregon, and rare and patchily distributed throughout most of the historical range in the United States west of the Rocky Mountains (Wiggins 2005). The current distribution in the western United States is still difficult to delineate, as cuckoos often wander before and after breeding (Hughes 1999). In the eastern United States and in eastern Canada, yellow-billed cuckoos are still a relatively common bird, but populations are declining in many areas (see the Population status section). Yellow-billed cuckoos winter in South America, primarily east of the Andes Mountains, but with small numbers (probably of the western subspecies) west of the Andes. (Hughes 1999). It appears that

this species was never common in the Rocky Mountains. There have been no recent breeding records in southwestern Colorado (Carter 1998c).

# Habitat across the Species' Range

Primary cuckoo habitat consists of lowland riparian forest and urban areas with tall trees, especially with dense undergrowth and thickets. Optimum nesting habitat is closed canopy riparian forest stands of 2 to 5 acres or larger with associated dense stands of understory woody vegetation. The western yellow-billed cuckoo is a riparian ecosystem obligate species.

#### Habitat on the San Juan National Forest

Suitable habitat on the SJNF is unknown but may occur in limited amounts. There is no recorded occurrence on the SJNF. Due to elevation and geographic location, and lack of suitable habitat quality, occurrence of this species would be considered rare and incidental.

## **Primary Risk Factors**

Loss, degradation, and fragmentation of riparian habitat; drought and prey scarcity (linked at least in part to pesticide use) may play a role in declines even where suitable habitat remains (Ehrlich et al. 1992). The range of the western subspecies of this bird has contracted, and populations have declined dramatically within the remaining range, due to loss of mature closed-canopy riparian forests with dense, thick, understories.

# White-tailed Ptarmigan

## Background

The white-tailed ptarmigan (*Lagopus leucura*) is a medium-sized grouse inhabiting alpine tundra areas. It is completely white in winter except black bill, eyes, and claws. Adult summer plumage is mottled with brown, black, and white, except for the all-white wings, tail, belly, and legs (Baily and Niedrach 1965). The white-tailed ptarmigan's winter diet consists of alder catkins, willow (*Salix* sp.) buds, and twigs (primary winter food in Colorado is willow buds), as well as buds and needles of spruces, pines, and firs. Spring and summer diet consists of leaves and flowers of herbaceous plants, willow buds, berries, seeds, and insects (NatureServe 2013).

#### Status and Distribution

White-tailed ptarmigan inhabit alpine areas from the southern Rocky Mountains in New Mexico north to Alaska and Northwest Territories (Braun et al. 1993). The species has also been introduced into the Sierra Nevada in California, Uinta Mountains in Utah, and the Wallowa Mountains in Oregon (Braun et al. 1993). In Colorado, white-tailed ptarmigan inhabit all mountain ranges with suitable alpine habitats, including Pikes' Peak, where it was introduced in 1975 (Braun 1971; Hoffman and Giesen 1983).

#### Habitat across the Species' Range

White-tailed ptarmigan primarily inhabit alpine tundra, especially in rocky areas with sparse vegetation (American Ornithologists' Union 1983). Summer habitats in the Rocky Mountains consistently include moist, low-growing alpine vegetation. In Colorado, percent canopy cover of willow was higher at winter feeding sites than at random sites (Giesen and Braun 1992). White-tailed ptarmigan nest in alpine tundra, in rocky areas or sparsely vegetated, grassy slopes. The species tends to search for vacant territory in the natal area. High fidelity to breeding territory is exhibited in successive years (NatureServe 2013). While typically found in habitats at or above the tree line, white-tailed ptarmigan also inhabit willow-dominated habitats at or below tree line in winter (Colorado Partners in Flight 2000).

#### Habitat on the San Juan National Forest

White-tailed ptarmigan have been observed on NFS lands of the SJNF on all three ranger districts in the Lizard Head wilderness area, Weminuche wilderness area, South San Juan wilderness area, and alpine and subalpine habitat adjacent to wilderness.

## **Primary Risk Factors**

Excessive grazing by domestic livestock and wildlife, mining, reservoir development, winter recreation, and road building have all negatively impacted alpine habitats, especially critical wintering areas (Braun et al. 1976). Chemical contamination from mine spoils into willow habitats has been shown to affect persistence in some areas. Critical periods are during the breeding period from June through September, and disturbance of critical wintering areas during the winter months.

#### 1.2.3 Invertebrates

## **Great Basin Silverspot Butterfly (Nokomis Fritillary Butterfly)**

## Background

The Nokomis fritillary butterfly (*Speyeria nokomis*) is a large and distinct fritillary that inhabits spring seeps and is associated with marshes with flowing water. It lives in wet meadows and seeps or sloughs at lower elevations, found only where there is permanent moisture sufficient to sustain a healthy violet crop at elevations from 5,200 to 9,000 feet. Habitats are generally described as permanent springfed meadows, seeps, marshes, and boggy streamside meadows associated with flowing water in arid country (Brock and Kaufman 2003; Hammond 1974; Opler and Wright 1999; Scott 1986; Tilden and Smith 1986). The Nokomis fritillary has one flight from mid-July to late September. For the species *Speyeria nokomis*, the wingspan is 2½ to 3½ inches. Also for the species the upper side of the male is a bright brownish orange with darkened wing bases and dark markings. Sub-marginal chevrons do not touch the very even black marginal line. The upper side of the female is black and the outer half of the wing has cream-colored spots. Both sexes have hind wing below with black-bordered silver spots. For Nokomis fritillary butterfly, the hind wing disc is light brown in males and deep olive in females. Males patrol for receptive females, who walk on the ground to lay single eggs near host plants. Unfed, first-stage caterpillars hibernate and in the spring they feed on the leaves of the host. They have one brood from late July to September (Arizona Game and Fish Department 2005).

#### Status and Distribution

The historic range of the Nokomis fritillary butterfly includes basin and range country from the Sierra Nevada in eastern California through Nevada and Utah to the Rocky Mountains in western Colorado, and south through eastern Arizona and New Mexico to northern Mexico (Selby 2007). It has been recorded from at least 56 counties in six states in the United States, and three states in Mexico. Some taxonomists consider this subspecies to be a narrowly endemic subspecies found only at a few locations in Colorado and eastern Utah while others consider it a more broadly distributed taxon found in Colorado, Arizona, Utah, New Mexico, and perhaps even Nevada (Arizona Game and Fish Department 2005).

## Habitat across the Species' Range

The Nokomis fritillary butterfly is found in streamside meadows and open seepage areas with an abundance of violets in generally desert landscapes. Colonies are often isolated (NatureServe 2013). For the species *Speyeria nokomis* the caterpillar host plant is northern bog violet (*Viola nephrophylla*). The adults feed on flower nectar including that from thistles (Arizona Game and Fish Department 2005)

#### Habitat on the San Juan National Forest

Surveys for this species have not been conducted on the NFS lands of the SJNF. No species occurrence or distribution data are available for the SJNF. There are two records of species occurrence south of the SJNF boundary on state and private lands

## **Primary Risk Factors**

Limiting factors for the species as a whole are mainly habitat loss, herbiciding, heavy grazing, and changes to hydrology (NatureServe 2013).

# 1.2.4 Amphibians

#### **Boreal Toad**

## **Background**

The boreal toad, also known as the mountain or western toad (Hammerson 1999), is Colorado's only alpine species of toad. Females generally grow to 4.3 inches and males to 3.5 inches. Both sexes appear warty and usually have a light stripe along the middle of the back (most prominent on the female). Juveniles may lack the central stripe and may have red warts. This toad preys on a variety of invertebrates. It is not selective about food and any moving animal is a potential meal so long as it is smaller than the toad (Campbell 1970). Ants may comprise a large portion of its diet (Keinath and Bennett 2000). Other prey include grasshoppers, beetles, mosquitoes, crane flies, stink bugs, damsel bugs, water striders, backswimmers, alderflies, moths, caterpillars, black flies, deer flies, muscid flies, wasps, bees, mites, spiders, and snails. Larvae filter suspended plant material or feed on bottom detritus (Keinath and Bennett 2000).

#### Status and Distribution

Bufo boreas boreas is one of two subspecies of the western toad found in the United States (USFWS 2002). The California toad (*B.b. halophilus*) is restricted in range to California. *B.b. boreas* forms two distinctly separate populations (Southern Rocky Mountain and Northern Rocky Mountain), which appear to be genetically different and probably represent independently evolving lineages (Keinath and Bennett 2000). These populations are separated by a swath of approximately 100 miles of harsh dry habitat in central Wyoming (Keinath and Bennett 2000). The Southern Rocky Mountain population occupies extreme south-central Wyoming, most of the mountains of Colorado, and, historically, the north-central mountainous portions of New Mexico. Only the Southern Rocky Mountain population occurs in Colorado and is the subject of this assessment. Hammerson (1999) suggests that, until there is a formal change in the scientific nomenclature, the California toad should be referred to as the western toad, the Northern Rocky Mountain population as the boreal toad, and the Southern Rocky Mountain population as the mountain toad. Although once considered fairly common in southern Wyoming, Colorado, and northern New Mexico, the Southern Rocky Mountain boreal toad is now much less common and absent in portions of its range. While some historic populations have existed on the SJNF, there are currently no known populations. Surveys for presences are conducted annually.

# Habitat across the Species' Range

The boreal toad (Southern Rocky Mountain population) generally occurs between 8,000 and 11,000 feet elevation in spruce-fir forests and subalpine and alpine meadows. The boreal toad typically inhabits areas with damp conditions in the vicinity of marshes, wet meadows, streams, beaver ponds, glacial kettle ponds, and lakes interspersed in subalpine forests. During the early spring and summer, boreal toads are usually found in water, at the water's edge, or on top of partially submerged logs. Later in the summer toads have been reported to disperse a considerable distance (up to 2.5 miles) from breeding areas to upland forest sites (Loeffler 2001). They still tend to favor moist sites. However, some toads, especially females, may relocate to drier montane habitats offering dense vegetation for cover. In Colorado, the largest populations are typically found in areas characterized by willows, bog birch (*Betula glandulosa*), and shrubby cinquefoil (*Pentaphylloides floribunda*) (USFWS 1994). In southern Colorado they have been reported in areas where ponderosa pine is present.

#### Habitat on the San Juan National Forest

Habitat for the boreal toad is found on NFS lands of all districts on the SJNF, primarily within the spruce-fir and alpine zones. Boreal toads have been reported as high as 11,860 feet in the San Juan Mountains. They have also been reported at lower elevations including an old Pagosa Springs record at 7,100 feet and another in Colbran at 6,800 feet. However, Hammerson (1999) suspects the accuracy of these low elevation records and feels that either the area of collection was incorrect or that the specimens were incorrectly identified

## **Primary Risk Factors**

The boreal toad shows declines in population size and distribution across its range in western North America. The population in the Southern Rocky Mountains (Wyoming, Colorado, and New Mexico) is particularly vulnerable to extinction during declines, as it is geographically isolated from all other populations of boreal toads. Scientists believe the chytrid fungus *Batrachochytrium dendrobatidis* to be a contributing factor in boreal toad declines since the 1970s and currently see it as the primary threat to boreal toad populations throughout the Southern Rocky Mountains. However, the impact of *B. dendrobatidis* is compounded by other threats, the most widespread being habitat alteration from human disturbances around wetlands and human-facilitated expansion of natural and introduced predators. Habitat fragmentation further isolates breeding populations, which increases the effects of these widespread threats and the risk associated with other threats, such as local changes (Keinath and McGee 2005).

## **Northern Leopard Frog**

## **Background**

The northern leopard frog (*Rana pipiens*) is a medium-sized frog with an adult body length that typically ranges from 2 to 3.5 inches with a maximum of 4.3 inches (Hammerson 1999). It is usually green in color, although some may be a light brown. Its back is covered with round or oval dark spots, creating a pattern that gives this frog its name. The call is described as a "chuckling," "gabbling," or snoring sound. Larvae of the northern leopard frog are primarily vegetarian gaining sustenance by filtering free-floating algae from their surrounding waters. However, they have been observed feeding on dead animal material including conspecifics. Beetles and grasshoppers may make up a large portion of their diets. Other common prey includes flies, wasps and bees, and spiders. Studies on stomach contents have also found mollusks, crustaceans, garter snakes, hummingbirds, and yellow warbler (*Dendroica petechia*) (Smith 2003).

#### Status and Distribution

The range of the northern leopard frog includes much of the southern half of Canada and the northern United States south to Maryland, West Virginia, Kentucky, northern Illinois, northwestern Missouri, Nebraska, New Mexico, Arizona, and eastern California (Hammerson 1999). The northern extent of the range in Canada is poorly known (Smith 2003). Within Colorado the northern leopard frog occurs throughout much of the state, although most occurrences are in the western half of the state, including the Front Range. On the eastern plains it occurs in more spotty distribution with populations associated primarily with major drainages systems (Hammerson 1999).

## Habitat across the Species' Range

The habitats used by the northern leopard frog are varied across its range. In Colorado it is reported to range in occurrence from below 3,500 feet in northeastern Colorado to above 11,000 feet in southern Colorado (Hammerson 1999). Merrell and Rodell (1968) describe three major habitat divisions: winter habitat (lakes, streams and ponds), summer habitat (post-breeding areas including upland habitats for feeding), and egg/tadpole habitat (shallow breeding ponds). Although aqueous habitats are a central feature in the frog's cycles of life, it may range a considerable distance from natal and breeding areas to a variety of other habitat types. Typical aqueous features used by the northern leopard frog include wet meadows and the banks and shallows of marshes, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches (Hammerson 1999). Streams are often used as dispersal corridors, but upland areas are also used. Suitable breeding habitat for the northern leopard frog on the SJNF would be found in streams, natural lakes and ponds, glacial kettles, stock ponds and reservoirs, marshes, and wetlands. Post-breeding habitat would be found along the edges of these features, as well as the surrounding upland habitats (generally within 2 miles). Wintering habitat would be found in streams, ponds, and lakes that do not completely freeze during winter and do not have substantial populations of predaceous fish.

#### Habitat on the San Juan National Forest

During the summers of 1994–1998 the SJNF conducted amphibian surveys in suitable amphibian breeding habitats across the forest, including suitable leopard frog habitat. The available district records

from these surveys were incomplete. Northern leopard frogs were determined to be present on at least six sites on NFS lands of the SJNF on the Dolores District and 16 sites on the Pagosa District. No records were available for the Columbine District. These surveys apparently sampled only a portion of the available suitable habitat within different elevation zones and did not include all suitable habitats on the SJNF. Therefore, it is likely that other local populations exist on the SJNF that were not identified during the 1994–1998 surveys.

## **Primary Risk Factors**

Loss or degradation of breeding habitat can occur through changes in hydrology or water quality. Other factors include habitat fragmentation, predation, disease, sensitivity to ultraviolet radiation, and recruitment into the population.

# 1.3 Effects Analysis

The purpose of this BE is to describe the direct, indirect, and cumulative effects from program activities associated with LRMP alternatives analyzed in the FEIS. The LRMP/FEIS and associated planning documents do not provide site or project-specific analysis. Instead, they provide the guidance for planning and implementing projects designed to move the land base toward meeting desired future conditions. Separate project-specific NEPA analysis would occur as projects are proposed for implementation.

The BE incorporates applicable management direction from the LRMP designed to aid in the management and conservation of sensitive species. In addition to the species-specific design criteria mentioned at the beginning of the BE, the LRMP contains over 100 components, including additional design criteria, objectives, and desired conditions that are meant to help provide for the ecological conditions in key habitat types necessary for all species. These components are outlined in Appendix M. LRMP and project-specific design criteria are intended to reduce potential impacts to species from the variety of land management activities implemented under the LRMP. The design criteria are the same under all of LRMP alternatives.

#### 1.3.1 Direct and Indirect Effects

There are 30 terrestrial sensitive species with habitat present on the SJNF. The wide variety of sensitive species and their preferred habitats in the planning area suggests that all LRMP alternatives would have some potential to affect species or their preferred habitats. For purposes of this analysis, species are grouped into analysis groups based on the primary associations utilized on the SJNF as described in the species evaluated section. The analysis groups include grassland, shrubland, riparian/wetland, forested, and alpine.

Species in the grassland group include ferruginous hawk, Gunnison's prairie dog, northern harrier, short-eared owl, and western burrowing owl. Species in the shrubland group include Brewer's sparrow and loggerhead shrike. Species in the riparian/wetland group include bald eagle, American bittern, peregrine falcon, black swift, boreal toad, Nokomis fritillary butterfly, New Mexico meadow jumping mouse, northern leopard frog, river otter, and western yellow-billed cuckoo. Species in the forested group include American marten, fringed myotis, hoary bat, spotted bat, Townsend's big-eared bat, boreal owl, flammulated owl, Lewis' woodpecker, northern goshawk, olive-sided flycatcher, and purple martin. Species in the alpine group include Rocky Mountain bighorn sheep and white-tailed ptarmigan.

The primary management activities that have potential to affect sensitive species include fire management (prescribed fire, fires managed for resource benefits, and wildland fire suppression), habitat improvements, lands and special uses, livestock grazing (cattle, horse, and domestic sheep and goat), mechanical fuels treatments, oil and gas development, recreation (summer and winter recreation including motorized, non-motorized, developed, and dispersed), solid mineral development, and timber harvest.

There are a number of risk factors listed for each species in the species evaluated section. Some of the risk factors (biological and environmental), including low reproductive potential, parasites and disease,

harvest, weather, etc., are usually not influenced by management activities; however, other risk factors such as loss or alteration of habitat or disturbance during key periods (i.e., breeding seasons) can be influenced by management activities and are primary risk factors for all species evaluated. Table T. 11 describes management activities and their potential to negatively affect habitat and species in each analysis group. A rating of low, moderate, or high is given based on the potential for management activities to negatively affect species either directly or indirectly. The overall effects would depend on the design, extent, timing, frequency, and duration of activities and associated projects. With application of design criteria in the LRMP, direct and indirect effects to species during project-level implementation are expected to be reduced. It must also be noted that management activities can result in positive effects to species and, for some, are the primary considerations for habitat enhancement. The effects (positive and negative) from management activities are discussed in detail below for each analysis group (Table T.11).

Table T.11: Potential for Management Activities to Negatively Affect Species in Each Analysis Group

Management	Potential for Management Activities to Negatively				
Activity	Affect Species in Each Analysis Group				
	Grassland	Shrubland	Riparian/Wetland	Forested	Alpine
	Group	Group	Group	Group	Group
Fire management					
Prescribed burns	Low	Low	Low	Low	None
Fire for resource benefit	Moderate	Moderate	Moderate	Moderate	None
Wildfire suppression	High	High	High	High	None
Habitat improvements	Low	Low	Low	Low	Low
Lands/Special uses	High	High	Moderate	High	Moderate
Livestock grazing	High	High	High	Moderate	High
Mechanical fuels treatments	Low	High	Moderate	High	Low
Oil and gas development	High	High	High	High	Low
Recreation (summer)	High	High	High	High	High
Recreation (winter)	Low	Moderate	Low	Moderate	High
Solid mineral development	High	High	High	High	Moderate
Timber harvest	Low	Low	High	High	None

# Fuels Management (Prescribed Burns, Fire for Resource Benefit, Wildfire Suppression, and Mechanical Fuels Treatments)

Prescribed fire, fire managed for resource benefits, wildland fire suppression, and mechanical fuels treatment activities would have effects (positive and negative) to sensitive wildlife species. Prior to Euro-American settlement, fire played an important role in creating and maintaining the vegetation communities in many terrestrial ecosystems, especially ponderosa pine and warm-dry mixed conifer forests. Fire suppression has contributed to the many changes seen in these ecosystems over the past 100 years. The use of prescribed fire, fire for resource benefit, and mechanical fuels treatments would help to restore the composition and structure of ecosystems, and help to maintain or restore the heterogeneous structure and pattern of the vegetation that was present on the SJNF during the reference period as described in the terrestrial ecosystems section in the FEIS. Fire and fuels management activities would affect sensitive species in the grassland, shrubland, riparian/wetland, and forested analysis groups. Direct and indirect effects from these activities for each analysis group are described below.

#### Prescribed Fire

The amount of area proposed for prescribed burning through ground or aerial ignitions is the same under each alternative (up to 6,000 acres per year), so the impacts to sensitive wildlife species would be the same under each alternative. Prescribed burning would occur in pinyon juniper, mixed shrublands, ponderosa pine, and warm-dry mixed conifer vegetation types. Most burning would occur during spring and fall when fire weather and behavior are conducive to meet burn plan objectives. Summer burning may also occur, particularly in areas that have prior mechanical fuels treatments.

Burning in mountain grasslands would result in an immediate, very short-term negative effect to northern harrier and short-eared owl. Effects include the temporary loss of forage habitat and cover for small mammal prey species, and cover used for breeding. As new growth occurs, there would be corresponding increases in the nutritive quality of grasses and forbs, thus returning and enhancing habitat for small mammals. In most instances small mammal prey species would see more palatable and higher quality forage. Long-term positive effects include the overall enhancement of grassland forage and breeding habitat.

Burning in sagebrush shrublands is generally limited due to its limited presence across the SJNF. Burning of sagebrush is generally approached in a cautious manner due to its slow rate of positive response and meeting desired sagebrush ecosystem resource objectives. Generally, burning in sagebrush habitat occurs only to meet very specific resource management objectives.

Burning in riparian/wetland areas may occur, but overall, minimal effects are expected to riparian/wetland sensitive species. Riparian/Wetland areas are often used as control features and/or management area boundaries. The vegetation present, along with the cool and oftentimes moist soils present, generally results in very low-intensity burns with minimal fire effects. Effects to riparian/wetland habitat used for foraging, cover, and breeding by American bittern, Nokomis fritillary butterfly, New Mexico meadow jumping mouse, northern leopard frog, and western yellow-billed cuckoo are expected to be minimal. Potential negative effects to bald eagle, bittern, leopard frog, and river otter are also expected to be minimal because of minimal impact expected to aquatic prey species and habitat. Black swift, boreal toad, and American bittern are not expected to be affected by burning, as most burns would occur in lower-elevation vegetation types rather than higher elevation vegetation types were suitable habitat for black swift and boreal toad are present. Burning that occurs in and adjacent to riparian areas would also help minimize fire effects and potential negative effects resulting from human caused wildfires or fires managed for resource benefits occurring near or in riparian/wetland habitats.

Burning in ponderosa pine and warm-dry mixed conifer forests generally results in the reduction of surface fuels (grass, needle, and leaf litter and downed woody material) and vegetation in the lower and mid-canopy layer such as shrubs and trees. In most instances prescribed burning occurs to complement mechanical fuels treatments. Burning in ponderosa pine and warm-dry mixed conifer forests would have short-term negative effects and long-term positive effects to sensitive species. Short-term effects include the removal of surface fuels as food sources and cover for small mammal prey species such as ground squirrels, which are common prey of northern goshawk. Thinning of trees, particularly within clumps, would affect goshawk nesting habitat and cover for rearing young, as well as roosting cover for hoary bat. Potential effects to key habitat components such as snags utilized as plucking and perching posts by goshawks and olive-sided flycatcher, and cavity roosts and nesting by fringed myotis, flammulated owl, and Lewis' woodpecker would be minimized with application of snag retention and recruitment design criteria.

Burning in ponderosa pine and warm-dry mixed conifer forests would have many long-term positive effects to sensitive species. All species are associated with open, park-like stand conditions. The combination of burning and mechanical vegetation fuels treatments are expected to provide more sustainable habitat for species in the long-term by improving habitat condition and enhancing resilience to insects, disease and wildfire.

## Fire Managed for Resource Benefit

Under Alternative A, up to 20,000 acres of the SJNF could be affected by fires managed for resource benefit. Fires managed for resource benefit could affect sensitive wildlife species on an additional 30,000 acres of the SJNF under Alternatives B, C, and D. Fires managed for resource benefit would have similar effects to sensitive species associated with grassland, shrubland, riparian/wetlands, and ponderosa and warm-dry mixed conifer forests as those described for management ignited fire. Potential effects are expected to be slightly greater as fires are expected to occur at larger scales, and under conditions that affect vegetation, soil, and other resources slightly more than those under prescribed fire. Factors such as location of burns, time of year, weather, fuel loading, and fuel moisture can be more easily planned, managed, and monitored.

Management of fires for resource benefit in mixed vegetation and spruce-fir forests would result in positive and negative effects to forested species associated with mid- to higher-elevation forests including American marten, boreal owl, and olive-sided flycatcher. Although these fires are a primary means for restoring natural disturbance processes to high-elevation forest vegetation types, impacts to vegetation and other resources are expected. Short- and long-term effects to species would depend on fire intensity and severity to vegetation and soil resources and corresponding effects to key habitat attributes. Marten and boreal owl are associated with mature, mesic coniferous forests that contain key habitat attributes such as downed logs and snags used for foraging and security, and large trees used for denning and nesting by primary prey species (voles, snowshoe hare, and red squirrel). Low- to moderate-intensity fires would likely result in minimal to moderate negative effects to habitat utilized by marten and boreal owl in the short term and positive in the long term, while high-intensity fires would result in more adverse effects in the short and long term. Olive-sided flycatcher is a species that is highly dependent on standing dead or dying trees that contain suitable perch sites extending above the forest canopy. The species is most commonly found perching and foraging on suitable trees along forest edges, openings in the canopy, riparian/wetland areas or on ridge tops, and post-burn areas. The species is a post-fire specialist, and therefore wildfires are expected to be mostly beneficial were suitable nesting habitat remains (live conifer trees) near post-burn areas.

## Wildland Fire Suppression

Wildland fire suppression is the primary management strategy for human-caused wildfires. A variety of actions are taken to suppress fires ranging in size from single tree fires (Type 5 incidents) to more complex fires (Type 4 followed by 3, 2, and 1 incidents) with Type 1 incidents being the most complex. Suppression tactics include but are not limited to construction of control lines via hand or mechanized equipment (chainsaws, dozers, etc.), establishing safety zones for crew and aerial resources, use of aerial fire retardant to slow rate of spread or reduce fire intensity, and collecting water from nearby water sources to aid in mop-up operations or reduce rate of spread and intensity. Wildfires generally result in similar effects to sensitive species and habitats as described above; however, negative effects can be greater, particularly when fires burn at much higher intensities. Resource input is collected from biologists and other resource specialists to aid in minimizing negative effects from wildfire suppression tactics and strategies, thereby reducing potential short- and long-term effects to species and habitats.

#### Mechanical Fuels Treatments

Mechanical fuels treatments under Alternatives A, B, and C would affect the vegetation and soils on approximately 4,500 acres per year. Mechanical fuels treatments under Alternative D would affect the vegetation and soils on approximately 5,500 acres per year. Alternatives A, B, and C would affect the vegetation and soils on fewer acres, but there would be less opportunity under these alternatives to use mechanical fuels treatments for ecosystem restoration purposes than under Alternative D.

Mechanical fuels treatments would occur in mixed shrublands, pinyon-juniper, ponderosa pine, and warm-dry mixed conifer forests. Fuels would be treated via chainsaw, hydro-axe, hydro-mower, feller-buncher, or similar equipment. Treatments would include cutting and removal of vegetation, chipping with specialized equipment on-site, and then removed, and in some instances cut material may be left on site. Treatments would affect sensitive species in the shrubland, riparian/wetland, and forested analysis groups.

Mechanical fuels treatments in shrubland habitats have potential to impact Brewer's sparrow and loggerhead shrike, although in most instances, sagebrush shrublands are minimally affected. Mechanical fuels treatments generally avoid direct treatment of sagebrush. Treatments generally focus on other species such as pinyon, juniper, ponderosa pine, or mixed shrub species where sagebrush is present. Treatment of other tree and shrub species has potential to inadvertently affect sagebrush through mechanical operations in treatment units such as cutting, skidding, and removing cut material, or impacts caused by accessing treatment units with heavy equipment. Therefore, potential negative impacts to Brewer's sparrow and loggerhead shrike are expected to be minimal. Treatment of encroaching trees species and other shrub species may result in positive effects to sensitive species by maintaining sagebrush habitat over the long term.

Mechanical fuels treatments in pinyon-juniper have potential to affect forested species particularly fringed myotis, hoary bat, spotted bat, and Townsend's big-eared bats that forage or roost in areas near suitable roost sites. Mechanical fuels treatments can have a positive effect on bat habitat by enhancing foraging habitat, while minimizing negative effects to roosting habitat. Sensitive bat species prefer roosting mostly in cliffs, caves and abandoned mines although some are known to roost in large-diameter standing snags with large wafers of hanging bark, cracks, and crevices (Adams 2003; Fitzgerald et al. 1994). Negative effects to cliff, cave, and mine roosting habitat are not expected, and effects to tree roosting habitat can be minimized through application of design criteria for snag protection and recruitment. Most bats prefer to forage on aerial insects in small to medium-sized forest openings or gaps, and along the vertical or horizontal edges where different habitat types or structural stages meet (Taylor 2006). The creation of small forest openings or gaps in otherwise uniform forest canopies enhances bat foraging habitat (Adams 2003).

Mechanical fuels treatments in ponderosa pine and warm-dry mixed conifer have potential to affect forested species such as sensitive bats (fringed myotis, hoary bat, and Townsend's big-eared bat) flammulated owl, Lewis' woodpecker, northern goshawk, and olive-sided flycatcher. Treatments would generally focus on thinning primarily small to mid-sized trees and shrub species such as Gambel oak (*Quercus gambelii*) to break up fuel continuity and reduce risk of high intensity wildfire. The resulting stand structure and general appearance would be more open, similar to stand conditions that were present during the reference period. Treated areas would contain small openings interspersed within clumps of mature and older trees, and stands containing a mix of age classes of desired tree species. Short-term negative effects are expected as treatments reduce suitable habitat structure and from disturbances occurring during key periods such as breeding seasons. Long-term effects are expected to be beneficial with LRMP design criteria and site-specific project design criteria applied to reduce negative effects to key habitat attributes (snags and downed woody material) and disturbance impacts to sensitive raptors from mechanized equipment operations and human activities.

Mechanical fuels treatments are not intended for riparian and wetland areas; however, direct and indirect effects may occur. The use of mechanized equipment in riparian areas is possible, but most likely limited to accessing treatment areas. Travel through riparian areas to access treatment units may result in negative effects to soils and riparian vegetation. Other negative effects may result from off-site activities that disturb upland soils, and the potential transfer of eroded material into riparian/wetlands thus affecting riparian vegetation. These negative effects are expected to be minimized with application of LRMP design criteria for watersheds and other site-specific design criteria applied during project implementation. With application of design criteria, negative effects to sensitive species in the riparian/wetland analysis group are expected to be minimal.

## **Habitat Improvements**

Habitat improvements vary from treatment in specific vegetation types to restoration of key species-specific habitat components. These improvements are designed to have mostly positive effects, and some would have short-term negative effects and long-term benefits to others. Past management activities such as fire management, lands and special uses, livestock grazing, mechanical fuels treatments, oil and gas development, recreation, solid mineral development, and timber harvest have all had varying effects to habitats across the forest, such as riparian, warm-dry mixed conifer, ponderosa pine, cool-moist mixed conifer, spruce-fir, and aspen. Alterations and impacts to these habitats were discussed above under fuels management, discussed below for each habitat improvement type, and later in the analysis. These improvements are created to maintain, improve, and restore these habitat types that are important to wildlife species.

Species-specific habitat improvements such as butterfly and bat habitat improvement and restoration are site specific and may occur in a variety of habitat types. General terrestrial wildlife habitat improvement may occur across a variety of habitat types (mostly warm-dry mixed conifer mixed with ponderosa pine) using prescribed fire and mechanical treatments to return conditions to be more representative to the HRV (see the Terrestrial Ecosystems section of the FEIS). Winter range habitat improvement for big game may occur in mountain grassland and shrubland, to enhance and improve winter habitat available to big game such as deer, elk and potentially Rocky Mountain bighorn sheep.

Habitat improvement activities have a low probability of negatively impacting species, but may have positive effects for many species by enhancing wildlife habitat through the selected treatments. Effects, both positive and negative for the grassland, shrubland, riparian/wetland, forest and alpine group are discussed below.

## Riparian Watershed Improvement

The trend in amount of riparian and wetland habitats on the SJNF is slightly downward due to persistent drought and gradually increasing demand for water uses. The trend in condition of riparian areas and wetlands is also likely to be downward for the same reasons. In Colorado, it is estimated that at least 40% of all vertebrate species are closely associated with riparian habitats (Hoover and Wills 1984). Improved management practices such as livestock grazing over the past 20 years have generally improved ecological conditions of riparian areas, wetlands, and spring and seep habitats on the SJNF; however, conditions are still far from the HRV.

Alternative C offers the most acres of riparian and watershed improvement (300 acres). Alternative B and D offer half (150 acres) with Alternative A offering the least (30 acres). Improvement to riparian and watershed habitats may include but are not limited to the continued improvement in management practices such as livestock grazing, installation of exclosures around sensitive areas and activities that encourage growth of herbaceous vegetation in wetland areas and stream corridors. These improvements would allow riparian areas to recover, which may benefit species in all analysis groups.

# Nokomis Fritillary Butterfly Habitat Improvement and Restoration

Existing habitats are generally described as permanent spring-fed meadows, seeps, marshes, and boggy streamside meadows associated with flowing water in arid country. Project activities that may impact riparian areas, springs/seeps, and streamside zones are especially important. These areas provide habitat for the host plant and for the development of young butterflies and eggs. These habitat conditions are scarce in the arid Southwest and tend to occur as small, widely separated and isolated fragments within the arid landscape.

Alternatives B and C offer the same number of sites of habitat improvement and restoration (two sites) with Alternative A offering one site restored and Alternative D offering none. Improvements to butterfly habitat may include but are not limited to the construction of exclosures around steeps and springs to protect sites, and noxious weeds treatments that would help prevent the spread of invasive species, thus allowing the host plant (northern bog violet) to thrive. These improvements, in general, would benefit other riparian/wetland group species, as well at the Nokomis fritillary butterfly. Protection of seep and springs may benefit all other analysis groups as these groups utilize riparian areas to some extent.

#### Bat Habitat Restoration and Protection

All sensitive bats, with the exception of hoary bat, may only reproduce in unique habitat features (such as caves, rock crevices, mines, and/or specific age classes of snags) that are relatively rare across the planning area. All local bat species concentrate around riparian habitats for foraging and drinking purposes. For this reason, slow-water pools and open wetlands are especially important.

All alternatives offer the same protection via installation of structures associated with mine closures at all sites, so the positive effects from the installation of these protective structures would be the same under each alternative. Improvements to bat habitat may occur through the installation of protective structures on mines with the primary intent to protect roosting sites, particularly at mine closures. Other habitat improvements benefitting bats are the restoration efforts in ponderosa pine, riparian/wetlands, mixed conifer, and aspen. Habitat improvement treatments in other habitat types, particularly low-elevation forested areas, are expected to help improve foraging habitat. Protective structures are expected to have neutral impacts to other species. Benefits to other species groups, particularly from habitat restoration efforts in the above habitat types, are addressed in the subsequent sections.

# Terrestrial Wildlife Habitat Improvement

Terrestrial wildlife habitat improvement may occur within a combination of habitat types, but mostly ponderosa pine and warm-dry mixed conifer. Conditions of ponderosa pine habitat are discussed below. Warm-dry mixed conifer forests are also rich in wildlife use. As the name implies, the vegetation mosaic of this vegetation type is generally found at lower elevations where sites are warmer and drier than that of cool-moist mixed conifer forests. Many decades of fire suppression, timber harvest, and livestock grazing have caused gradual but substantial shifts in tree species, structural stage composition, and fire frequency, resulting in many warm-dry mixed conifer stands to be outside their HRV. Currently, warm-dry mixed conifer forests have less acres in the old growth development stage, and have less diversity and distribution of native grasses compared to HRV conditions, with implications for wildlife species and populations that are most closely associated with those development stages.

The acres proposed for the above habitat restoration activities are the same for Alternatives B and C (2,000 acres) and slightly less for Alternatives A and D (1,500 acres). Improvement to terrestrial wildlife habitat may occur through management actions such as mechanical fuels treatments, timber harvest, and prescribed burning that serve to enhance forest structure and increase the extent and distribution of these stands across the SJNF. These improvements are expected to move ponderosa pine and warm-dry mixed conifer forests more towards conditions expected under HRV during the reference period, thereby improving habitat conditions and capability for wildlife species most closely associated with these ecological attributes. More open conditions created from management activities may enhance foraging habitat for members of the forested species group, particularly fringed myotis, hoary bat, flammulated owl, Lewis' woodpecker, northern goshawk, and olive-sided flycatcher. Some short-term impacts may be seen for these species if large snags or other trees used for nesting and roosting are removed during management activities; however, this effect is expected to be negligible across the landscape as the overall condition of the habitat would be more representative of conditions that historically existed.

#### Ponderosa Pine Restoration

Many decades of fire suppression, timber harvest, and livestock grazing have caused gradual but substantial shifts in tree species mixes, and structural stage and understory composition, resulting in many ponderosa pine stands now being considered to be outside their HRV. Currently, ponderosa pine forests have fewer acres in the old growth development stage and less diversity and distribution of native grasses compared to HRV conditions, with implications for wildlife species and populations that are most closely associated with those development stages. Ponderosa pine forests support a rich and diverse wildlife community, including some habitat specialists that reach their highest densities in this vegetation type.

Alternatives B and C offer the same acres of restoration (3,000) followed by Alternatives D and A (2,000 and 1,000 acres, respectively). Improvement to ponderosa pine habitat may occur through mechanical treatment, prescribed fire, and timber harvest. These improvements would help move conditions towards HRV in ponderosa pine, which may benefit species in the forested group, particularly fringed myotis, hoary bat, flammulated owl, Lewis's woodpecker, northern goshawk, and olive-sided flycatcher. Similar to effects from management activities outlined for terrestrial habitat improvement, some short-term impacts may be seen for these species if large snags or other trees used for nesting and roosting are removed or consumed during management activities; however, this effect is expected to be negligible across the landscape as the overall condition of the habitat would be more representative of conditions that historically existed. Other species that utilize ponderosa pine and adjacent habitats such as the shrubland and grassland groups may benefit from more open conditions created from pine restoration activities.

## Cool-moist Mixed Conifer and Spruce-fir Restoration

Within the planning area, the cool-moist mixed conifer forest type is dominated by white fir and Douglas-fir trees. Some cool-moist mixed conifer forests succeeded from aspen-dominated forests that were established following stand-replacing fires. Others formed when white fir and Douglas-fir trees initially colonized a site following a disturbance event. Some may have succeeded from the warm-dry mixed conifer type, where the less shade-tolerant ponderosa pine component decreased as the more shade-

tolerant Douglas-fir and white fir components increased in abundance. The selective harvesting of ponderosa pine trees from warm-dry mixed conifer stands resulted in some cool-moist mixed conifer forests. Currently, most of the cool-moist mixed conifer forest type is in the mature and old growth development stages. Spruce-fir forests are a mixture of two species, Engelmann spruce and subalpine fir. Spruce-fir forests are rich in mammal and bird species but they support relatively few reptile or amphibian species because of the higher elevations. Extensive mortality of mature trees has occurred over the last 10 years from spruce bark beetle impacts. In some areas, the majority of mature spruce trees have been killed from insects and disease.

The acres proposed for the above habitat restoration activities are the same for Alternatives B and C (2,000 acres) and slightly less for Alternatives A and D (1,000 acres). Improvements to cool-moist mixed conifer and spruce-fir may include, but are not limited to mechanical treatment, fire managed for resource benefit, and timber harvest. These improvements would help create a more diverse age structure and address issues with insect and disease, which may benefit species in the forested group, particularly American marten, boreal owl, and olive-sided flycatcher. Other species that utilize these habitats might be the riparian/wetland group, particularly the boreal toad, which has historic occurrence within the planning area but is not known to currently occur. Short-term impacts to these species may occur through the loss of canopy cover, removal of snags that may be utilized for nesting, denning or resting, or from ground disturbance associated with treatments to ground-dwelling species such as boreal toad; however, long-term stand conditions are expected be more healthy and resilient with a more diverse age structure.

# Winter Range Habitat Improvement

These areas primarily occur on the SJNF in pinyon-juniper, ponderosa pine, mountain shrubland, and sagebrush shrubland habitats below about 8,000 feet, although the upper elevation limit fluctuates, depending on seasonal snow depth, and may be higher for bighorn sheep. Winter range extends across the southern and western portions of the SJNF and onto a variety of adjacent land ownerships, including BLM, state, tribal, and private lands. While winter range is extensive across all ownerships, it is not equal to the quality and extent of summer range on the SJNF, and it is believed that winter range amount and habitat effectiveness could become a limiting factor to big game populations in the future.

Alternative B offers the most acres of habitat restoration (5,000) with Alternative C offering half the acres (2,500), followed by Alternatives D and A, which both offer 1,000 acres of habitat restoration. Improvement to winter range may occur through mechanical treatment and prescribed burning in mountain shrublands and grasslands, pinyon-juniper, and ponderosa pine. These improvements would help increase the health and vigor of the above habitats, not just for big game species but members of the grassland group (ferruginous hawk and northern harrier), shrubland group (Brewer's sparrow, and loggerhead shrike), and forested group (fringed myotis, Townsend's big-eared bat, hoary bat, and spotted bat). Short-term effects from prescribed burning to the above species are outlined in the fuels management section above. In general, immediate short-term effects to the above species may occur, followed by new growth of grasses and forbs, thus returning and enhancing habitat for small mammals and producing higher-quality forage for big game. Long-term positive effects include overall enhancement of grassland forage and breeding habitat.

#### Aspen Habitat Restoration

Aspen forests range from occurring as pure stands to a mixed overstory of aspen trees and conifer trees with the most abundant tree species being aspen. Where aspen trees intermix with conifer trees, the resulting aspen-dominated forests usually supports a wider variety of wildlife species than conifer-dominated forests nearby. The trend in amount of aspen on the SJNF is stable, but there is a declining trend in the amount of aspen in early successional stages and a trend of increasing conifer succession in the understory of many aspen stands.

The acres proposed for the above habitat restoration activities are the same for Alternatives B and C (3,000 acres) and slightly less for Alternatives A and D (1,000 acres). Improvement to aspen habitat may occur through timber harvest. These improvements would increase the amount of suckering to recruit future nesting habitat for species like flammulated owl, northern goshawk, and Lewis' woodpecker. Aspen-dominated forests are extremely rich habitats for many wildlife species; therefore, the clearing of

downed and decadent aspen would increase forage for many species such as bats. These activities may benefit species in the forested group (fringed myotis, hoary bat, flammulated owl, Lewis' woodpecker, northern goshawk, olive-sided flycatcher, and purple martin), as well as in the riparian group (northern leopard frog and boreal toad). Short-term negative effects from ground disturbance associated with treatments may negatively impact ground-dwelling species such as boreal toad and northern leopard frog. Some large snags or decadent trees that may provide nesting habitats for some of the forested group may be lost during activities; however, the effects from restoration efforts are expected to increase the health and vigor of the stand, enhancing wildlife habitat in the long-term. Further impacts to species are addressed in the timber harvest section below.

## **Lands and Special Uses**

The SJNF administers approximately 700 non-recreational land use authorizations consisting of special use permits, rights-of-way (ROW) grants, easements, and leases that authorize the occupancy and use of public lands by government agencies, private individuals, or companies for a variety of activities (including roads, dams, pipelines, and other private or commercial uses). The SJNF special uses program also authorizes the occupancy of public lands for pipelines, communication lines, power transmission lines, and communication sites.

For the purposes of this analysis, future special use authorizations cannot be predicted as to specific location, scale, and timing; therefore, there is no clear way to estimate the impacts of a special uses program under the requirements under various alternatives. Ultimately, the degree of the impacts of any project would depend on approved conservation strategies, critical habitat designations, and biological opinions that mandate specific management requirements for land uses. These requirements would not be known until specific project proposals are submitted and assessed.

All species groups may be affected by lands and special uses activities. In general, effects to wildlife from lands/special uses programs are generally similar to other land management activities. Effects to habitat include loss of habitat important components through removal of vegetation and structural attributes such as snags and downed woody debris. Other potential effects to habitat include habitat modification (modification of vegetation, soil, or water) and pollution (habitats contaminated with foreign materials). The most influential impact to wildlife from lands/special uses programs is activities that reduce habitat effectiveness through the indirect effects of human disturbance, causing individual animals to be displaced from preferred habitats to areas of lesser habitat capability or reduced security. The degree to which human disturbance affects wildlife species is dependent on type of human use/activity, the intensity of human activity, the timing of human activity in relation to important animal life functions, and the location of human activity in relation to key habitat attributes.

In general, application of LRMP design criteria and referenced guidance and best management practices (BMPs) is expected to ensure that impacts to wildlife from activities conducted by this program areas would be minor to moderate, limited in scale in relation to requisite habitats, and limited in duration to minimize impacts during times of important life functions.

## **Livestock Grazing**

Livestock grazing has been occurring across the SJNF since prior to the establishment of the San Juan Forest Reserve in 1905. Following 1905, many changes in management were implemented in an effort to properly manage the rangeland resource. Some of the noteworthy changes included dividing domestic livestock ranges into distinct grazing districts (allotments) and assigning these areas to specific permittees with designated numbers and seasons of use, including the designation of specific trailing areas to be used to access the allotments.

Past livestock grazing has had a significant impact on the current conditions seen in many of the terrestrial ecosystems on the SJNF, particularly mountain grasslands, semi-desert shrublands, semi-desert grasslands, sagebrush shrublands, and pinyon-juniper woodlands. Since the early 1900s, there has been a significant reduction in the numbers of cattle and sheep that graze on the SJNF. For example, in the 1930s, approximately 216,684 sheep and 41,968 cattle were permitted on the SJNF. In 2012,

approximately 14,330 sheep and 23,412 cattle were permitted. Currently, a little over half of the SJNF is considered suitable for livestock grazing, and although impacts from livestock and impacted areas are still present, impacts have been reduced with more effective rangeland management techniques and adaptive management approaches.

Proposed stocking rates and the amount of area available for permitted livestock grazing varies between alternatives. Alternative D has the potential to affect the highest number of acres and proposes the highest cattle stocking rates, and therefore has the most potential to affect sensitive wildlife species. Alternative B has the next highest potential to affect sensitive wildlife species, followed by Alternatives A then C due to incrementally lower numbers of permitted cattle and fewer acres considered suitable for grazing. Alternatives A, B, and D have the same number of acres suitable for domestic sheep and goat grazing, and Alternative C has the least number of acres suitable for grazing. Alternative D proposes the highest domestic sheep and goat stocking rates and therefore has the most potential to affect sensitive wildlife species. Alternatives A and B have the next highest potential to affect sensitive wildlife species given the same stocking rates, followed by Alternative C with the least amount of animals proposed for stocking.

Livestock grazing on NFS lands occurs under the authorization of grazing permits.

Grazing permits authorize a permittee to graze livestock and are generally issued for a 10-year period on specific portions in designated allotments. The permittee is required by the permit to graze under specified terms and conditions designed for resource protection and enhancement, as described in an allotment management plan, which is incorporated as part of the permit. Permits are administered annually through issuance of annual operating instructions. Grazing permits by themselves do not authorize the permit holder to develop water, construct fences, build roads or trails, manipulate vegetation, or conduct other ground-disturbing activities. The authorization of these or similar ground-disturbing activities is based on the outcome of project-specific NEPA analysis.

Livestock grazing activities would affect sensitive wildlife species in all analysis groups. Effects to species are similar among groups and are primarily influenced by the areas grazed, permitted livestock numbers and class, timing and duration of grazing, and the type of grazing system used and operations to manage livestock distribution as described below.

Cattle are grazed in permitted range allotments across the forest at the lower, mid, and upper elevations (below tree line). Grazing by domestic sheep and goats occurs mostly in the higher elevations (alpine habitat) compared to low elevations where only a few sheep allotments are present. Livestock grazing occurs in areas classified as primary and secondary range. Primary rangelands are preferred by livestock and are associated with gentle slopes and contain abundant forage production. Primary rangelands include grasslands, shrublands, riparian areas, alpine, and open forested stands. Secondary rangelands are less preferred by livestock, as they contain less forage production when compared to primary rangelands. Secondary rangelands are generally present in dense shrublands and forested areas on moderately steep slopes. Forested areas that contain high canopy closures, extensive dead and down material, steep slopes, or soils types that are less conducive for grass-forb production are areas less preferred by domestic livestock.

Grazing is authorized on permitted allotments during specific time frames. Currently, there are 97 cattle allotments on the SJNF, which include 27 on the Columbine District, 34 on the Dolores District, and 36 on the Pagosa District. Most cattle grazing (yearling, cow-calf pairs, or mixed age classes and sexes) occurs from early June to early October. Currently there is a total of 28 domestic sheep grazing allotments on the SJNF, which include 19 on the Columbine District, seven on the Dolores District, and two on the Pagosa District. The domestic sheep grazing season varies by location, but generally runs from mid-June (low elevations) or early July (high elevations) to mid-September or early October.

The most common types of grazing systems used across the SJNF are rotation, deferred rotation, and rest-rotation. The type of system used is dependent on site-specific conditions and forage capability and suitability. The rotation system involves the movement of livestock from one pasture to another on a scheduled basis. Deferred rotation involves delaying grazing until seed maturity of important forage

species. Under a rest rotation system, generally one pasture is rested or receives non-use while the other pastures are grazed. There is no year-round grazing on designated allotments across the SJNF.

There are a variety of operational strategies used in managing livestock across the SJNF. Some livestock are trailed to designated allotments, while others are transported by vehicle. In some instances, range improvement projects are initiated to manage livestock distribution such as the construction of fencing (brush, wire, and pole) and water developments (spring development, stock ponds, and reservoirs) and associated maintenance, salting, and range riding.

In general, effects to sensitive species may result from the direct competition between livestock and wildlife for food or cover. Other effects may result from the short- or long-term reduction in habitat quality or reduced habitat effectiveness, potentially affecting breeding and foraging habitat, and habitat used by prey species such as insects and small mammals. Operational activities such as fence construction and water developments, and managing herd distribution can also affect species. Poor fence design or lack of maintenance can result in hazards such as entanglement resulting in injury or death, an impact most likely affecting sensitive birds and bats. In most cases, construction of fences and water developments requires the removal of grassland, shrub, or forested vegetation at small scales, and therefore no appreciable negative effects to habitat are expected. Although vegetation removal can result in loss of habitat, these projects can also benefit wildlife species by mitigating negative effects from grazing such as reducing the timing and extent livestock graze in primary rangelands. Moving livestock from pasture to pasture or across allotments may cause minor disturbance temporarily displacing wildlife. Repetitive use of certain routes by livestock can reduce habitat at small scales, and create non-system trails that may encourage public use causing disturbance. Invasive species such as noxious weeds may be introduced during any of the management activities and may expand into previously disturbed and undisturbed areas negatively affecting forage quantity and quality.

Based on the considerations described above, sensitive species in the grassland, shrubland and riparian/wetland groups, and forested species that prefer more open stand conditions (fringed myotis, hoary bat, Townsend's big eared, flammulated owl, Lewis' woodpecker, northern goshawk, olive-sided flycatcher, and purple martin) are expected to be most affected by livestock grazing. Many of these species nest/roost, breed, and forage in or in close proximity to primary rangelands during the time cattle are turned on to the allotments. The reduction or alteration of grassland, shrubland, or riparian/wetland vegetation have potential to negatively affect habitat for the species and their prey, especially those that nest on the ground (American bittern, northern harrier, short-eared owl, western burrowing owl, and Nokomis fritillary butterfly), den below the surface (Gunnison's prairie dog and New Mexico meadow jumping mouse), or nest in shrubs (Brewer's sparrow). The extent and duration of grazing generally coincides with potential effects to species and habitats; therefore, species area expected to be less affected by rest rotation, followed by deferred rotation, and more traditional rotation system. Species in the forested group, particularly those associated with dense mixed conifer and spruce-fir forests (marten and boreal owl) are less likely to be affected by grazing due to the lack of grazing and associated activities, and minimal overlap with habitat used by the species.

Domestic sheep and goat grazing in alpine habitat has potential to affect white-tailed ptarmigan and Rocky Mountain bighorn sheep. For ptarmigan, the primary effect of sheep grazing is a reduction in food availability. Domestic sheep are generally turned on to allotments in early July, during or shortly after the peak of ptarmigan hatch. Although newly hatched chicks are mainly consuming insects, they quickly shift their diet to plant matter similar to adult ptarmigan. Some of the most important foods identified in the diet of domestic sheep on alpine ranges are clovers and bistorts, the same forbs that comprise a substantial percentage of the summer and fall diets of ptarmigan. Another potential negative effect of sheep grazing on ptarmigan habitat is browsing impacts to upland willows of moderate to low stature, reducing food availability and hiding cover in brood rearing areas and summer/fall foraging areas. Any activity, including sheep grazing, that negatively affects willows or reduces the abundance of species diversity of the forb community in areas used by ptarmigan during the summer and fall can negatively affect ptarmigan.

Projects or activities associated with LRMP implementation that have potential to influence habitat quality, quantity, and effectiveness for bighorn sheep include recreation management, fire/fuels management, and livestock grazing management. Although habitat degradation from fire suppression, highways,

livestock grazing, and human disturbance is of concern to bighorn sheep, the susceptibility of bighorn herds to extirpation as a result of diseases that may be transmitted by domestic sheep or goats appears to be the greatest threat to bighorns.

There are five Rocky Mountain bighorn sheep populations present on the SJNF, most of which are present in or utilize alpine habitat. Current national direction requires a risk assessment be prepared for bighorn sheep as part of a plan revision and is part of the planning record (USFS 2011b). The assessment addressed risk of contact between domestic sheep and goats and bighorn sheep. The results from the risk assessment show that physical contact between bighorn sheep and domestic sheep and goats is high for 24 allotments, moderate for three allotments, and low for one allotment. The risk assessment also prioritized grazing allotments for future analysis and management. Project-level analyses would review the findings of the SJNF-wide risk assessment, follow LRMP direction to avoid risk of contact between domestic sheep and bighorns, and apply BMPs at the project-level. Site-specific conditions would dictate the best management solutions to avoid risk of contact. The risk assessment is part of the project record (USFS, 2013).

LRMP guidance for bighorn sheep and domestic sheep is the same for the alternatives and may require differing levels of management design in order to meet LRMP standards during site specific implementation. With respect to findings from the risk assessment, Alternative B could maintain the same permitted numbers and area of domestic sheep grazing as Alternative A. For this reason, there would be little difference between Alternative A and B in potential for physical contact between bighorn and domestic sheep. Under Alternative C, livestock grazing could be managed to enhance other resources including wildlife, cultural, and soils values, which could result in lower livestock stocking rates. Under Alternative C, domestic sheep numbers and suitable acres could be reduced compared to all other alternatives. Alternative C could therefore reduce the potential for physical contact between domestic and bighorn sheep, thereby also reducing the complexity of project design needed to reduce the potential for a bighorn sheep mortality event during LRMP implementation, compared to Alternatives A, B, or D. Under Alternative D, livestock grazing could be managed to increase grazing opportunities and therefore could increase domestic sheep numbers. For this reason, Alternative D could result in greater complexity of project design to address the potential for physical contact between domestic and bighorn sheep, therefore reducing a greater potential for a bighorn sheep mortality event, as compared to Alternatives A. B. or C.

The combination of fewer numbers of livestock, fewer acres available for grazing, and the application of LRMP and site-specific design criteria would help minimize negative effects to sensitive species from domestic livestock grazing.

## Oil and Gas Development

Much of the anticipated oil and gas development on the SJNF is expected to be in lower-elevation habitat types including pinyon-juniper, ponderosa pine, and warm-dry mixed conifer forests, as well as in sagebrush and mountain shrublands and in desert grasslands. Lesser amounts of oil and gas development are expected in higher-elevation habitats such as cool-moist mixed conifer, aspen, and spruce-fir forests. The potential for oil and gas development in alpine habitat is low due to geological formations, which are not known to have any oil or gas reserves.

For these reasons, sensitive species more closely associated with low to mid elevation habitat types (bald eagle, American bittern, peregrine falcon, Brewers' sparrow, ferruginous hawk, flammulated owl, fringed myotis, Nokomis fritillary butterfly, Gunnison's prairie dog, hoary bat, Lewis' woodpecker, loggerhead shrike, New Mexico meadow jumping mouse, northern goshawk, northern harrier, northern leopard frog, river otter, short-eared owl, spotted bat, Townsend's big-eared bat, western burrowing owl, and yellow-billed cuckoo) are more likely to be negatively affected by oil and gas development than sensitive species associated with higher elevation habitats (American marten, boreal owl, black swift, boreal toad, Rocky Mountain bighorn sheep, and white-tailed ptarmigan). The development of oil and gas resources on the SJNF would affect sensitive wildlife species primarily in the grassland, shrubland, riparian/wetlands, and forested analysis groups.

Impacts from oil and gas leasing and development on the SJNF are likely to occur within reproduction, migration, and movement corridors, and wintering habitats (or some combination of all three) depending on the species and season of occurrence. For every action carried out under any LRMP alternative, some sensitive species could benefit from habitat changes, some sensitive species may not be impacted at all, and some sensitive species may be negatively impacted. The degree of impact to sensitive species would differ depending on factors such as primary habitat association, effect to key habitat components, habitat generalist or specialist, and season of species occurrence.

Potential impacts to sensitive species may occur in areas where existing oil and gas leases are present and in new lease areas. Potential impacts are expected to be greatest in areas with high potential for oil and gas development, including the Northern San Juan Basin, San Juan Sag, and the Paradox Basin/ Gothic Shale Gas Play (GSGP) area. Alternative D has the largest amount of acreage available for leasing, followed by Alternatives A, B, and C.

The degree of impact and range of effects would depend on the sensitive species affected, the scope and scale of the project, and many other factors. The degree and direction of impact would likely vary, depending on factors such as project type, the time of year projects are implemented, general habitat type, and application of project design criteria and lease stipulations.

Lease stipulations guide how potential development could occur across areas leased. Lease stipulations are applied to protect various resources (soils, watersheds, terrestrial and aquatic wildlife and habitat, cultural resources, etc.) from adverse effects from development activities. Roadless areas have a No Surface Occupancy (NSO) stipulation applied, and for lands outside CRAs, a full range of leasing stipulations are assigned, including NSO, Timing Limitation (TL), Controlled Surface Use (CSU), and standard lease terms to protect various resources. Designated wilderness areas and the Piedra Area are areas withdrawn from leasing by law. Additionally, approximately 67,700 acres are recommended for wilderness and WSR designation, and administratively not available for lease.

Alternative B contains the most acreage where NSO stipulations would be applied followed by Alternatives A, D, and C. Alternative A contains the most acreage where TL stipulations apply, and no TL stipulations would be applied across Alternatives B, C, or D.

Alternative D contains the most acreage where CSU stipulations apply, followed by Alternatives B, A, and C. Alternative D contains the most acreage where standard lease terms apply, followed by Alternatives A, B, and C.

Sensitive species that are expected to be most impacted by oil and gas activities are those with relatively narrow tolerances to disturbance (bats, raptors, and amphibians), species with restricted year-round or seasonal habitats (hibernacula/roosting sites such as caves for sensitive bats), and/or species with habitats that are limited across the planning area (sagebrush habitat for Brewer's sparrow and loggerhead shrike). One oil and gas lease stipulation applies specifically to bat habitats, but a variety of lease stipulations designed to protect other resources would also provide substantive protections to habitats for bats, loggerhead shrike, Brewer's sparrow, amphibians, and raptors) (see Appendix H).

In general, the amount of habitat likely to be affected by oil and gas leasing and development during LRMP implementation under any of the alternatives is expected to be relatively small when compared to the total amount of habitat currently available across the SJNF. For this reason, and for most sensitive species, the impacts of direct habitat loss would be relatively small and likely not sufficient to result in population-level impacts or in changes to species distributions across the SJNF. However, for some sensitive species that are associated with relatively rare riparian areas and wetlands (New Mexico meadow jumping mouse, northern leopard frog, Nokomis fritillary butterfly) or unusual habitats such as mature cottonwood gallery forest (yellow-billed cuckoo), it is possible that LRMP implementation activities that affect that particular rare or unusual habitat or important structural attribute could have locally more substantial impacts to a specific sensitive species. For all these reasons, impacts to species would vary under all of the alternatives.

The No Leasing Alternative would provide the greatest protection for sensitive species on the SJNF, but some loss of key habitat components is likely under the alternative due to development of lands that have already been leased. Of the action alternatives, Alternative C would have the least potential for impacts to sensitive species habitats, followed by Alternatives B, D, and A, respectively. This is based on the projected total combined acres of disturbance on leased and unleased lands for conventional and GSGP within the Paradox Basin, and therefore the relative potential for oil and gas activities to reduce the abundance or affect the distribution of key habitat components for sensitive species. It is also based on relative expected levels of disturbance associated with oil and gas operation activities in and adjacent to production areas.

Total projected disturbance acres are very similar for Alternatives A and D, with somewhat less disturbance projected for Alternative B, followed by substantially less disturbance for Alternative C, respectively. There is only about a 19% difference in total combined acres of projected disturbance between the most impactive alternative, Alternative A, and the least impactive alternative, Alternative C. The No Leasing Alternative would have the least amount of projected total disturbance acres, but still projects about 35% of the development in the Paradox Basin that is projected to occur under the most impactive alternative, Alternative A. Projected acres of development in areas already leased do not vary by alternative and would be about 38% of total projected development. Conversely, about 62% of projected development within the Paradox Basin would be on unleased lands and thus represents new potential impacts to habitats for sensitive species.

A variety of leasing stipulations (see Appendix H) and LRMP standards and guidelines and other referenced guidance are expected to reduce potential negative effects of oil and gas leasing and development on sensitive species, and provide habitat conditions necessary to conserve sensitive species on the SJNF. Nine oil and gas lease stipulations apply specifically to sensitive species habitats and conservation measures, but a variety of lease stipulations designed to protect other resources would also provide substantive protections to sensitive species and the habitats on which they depend (see Appendix H). Some of this LRMP direction, such as leasing stipulations, is applied at the leasing stage, whereas other LRMP direction, such as standards and guidelines, is applied at the project development stage during LRMP implementation. LRMP direction is expected to provide the ecological conditions necessary to support sensitive species populations widely distributed across the SJNF.

#### Recreation

The population changes in Archuleta, Dolores, La Plata, and Montezuma Counties is indicative of the growth rate around the SJNF. From 1991 through 2000, these four counties grew by approximately 43%. The growth projection for the year 2025 is 63% (U.S. Census Bureau 2000). This population growth has been fueling a recreation boom that utilizes expanding technological advances in motorized recreation devices, as well as a growing array of non-motorized recreational pursuits that are expanding their influence across the landscape. Increased demand for recreational opportunities is expected to continue for the foreseeable future. The growing human population, technological advances in recreational equipment, and development of new forms of recreation has expanded human activity into a variety of wildlife habitats and into previously secure habitat areas, including areas where direct human influences were previously minor or absent. This trend during the past 30 years of increased overall human presence and activity is expected to continue and likely increase for the foreseeable future. As a consequence, the amount, condition, and effectiveness of some key wildlife habitats are expected to decline for the foreseeable future.

The planning area offers a variety of dispersed outdoor settings and opportunities, often defined by a semi-primitive and predominantly natural environment. A combination of features offers suitable terrain for camping, picnicking, mountain biking, off-highway vehicle driving, snowmobiling, backcountry skiing, hunting, and other dispersed uses.

#### Summer

An inventory of dispersed campsites shows camps often clustered along streams in valley bottoms. Concerns have been raised regarding wildlife impacts associated with heavily used, and easily accessed,

dispersed recreation areas. Locations close to communities such as Cortez, Durango, and Pagosa Springs also show the impacts of constant and intensive dispersed day use.

Summer recreation impacts to sensitive wildlife species are possible from activities such as camping, hiking, mountain biking, horseback riding, and motorized recreation. Recreation use is widespread, and would occur to some extent in all habitats on the SJNF, but impacts are typically confined to localized areas such as designated trails, frequently used dispersed areas, or developed recreation facilities such as campsites or trailheads. All species groups are expected at some point to be impacted by summer recreation. In general, the application of LRMP design criteria, referenced guidance, and BMPs is expected to ensure that impacts to wildlife from recreation program activities would be minimized during times of important life functions. Use of these design criteria during project-level planning would help minimize impacts to sensitive species, but impacts from dispersed recreation are still possible.

While the actual direct impacts from different types of recreation use are similar for all alternatives, the amount of area potentially impacted varies by alternative, primarily because of differences in the number of acres that would be designated as suitable for motorized use. Alternative A has the most amount of area designated as suitable for motorized recreation, and is the only alternative that allows motorized travel off of designated routes, and therefore has the potential have a greater impact to species from negative impacts to habitat and disturbance. Alternative D has the second highest amount of area designated as suitable for motorized recreation, followed by Alternative B. Alternative C has the fewest number of acres designated as suitable for motorized recreation, and therefore has the potential to impact sensitive wildlife species on the fewest number of acres.

General effects to species groups from recreation vary, but the greatest impact from recreation is disturbance to those species sensitive to human intrusion, particularly during breeding season, which overlaps the summer recreation period. As mentioned above, all species groups are likely to be impacted at some point by recreation activities, but species in the forested group (fringed myotis, Townsend's bigeared bat, and northern goshawk), riparian/wetland group (peregrine falcon), and alpine group (Rocky Mountain bighorn sheep and white-tailed ptarmigan) are the species most negatively affected by disturbance from recreation activities at roost sites, nesting sites, or lambing areas during breeding season. Habitat loss and alteration from newly developed recreation areas or projects may occur but these would vary and would be analyzed at the project level.

#### Winter

Effects from winter recreation correspond to the increasing human population in southwest Colorado and other parts of the country attracted to the area's winter recreation opportunities. This has resulted in an increased demand for access to recreational opportunities on snow. In addition, snowmobiles have increased in power and reliability, allowing them to access more terrain. Backcountry skiers now also have better equipment, and there has been an overall surge in adventure skiing. Another emerging sport is hybrid skiing, which is where a snowmobile tows or carries a skier or snowboarder up hills.

Although winter recreation opportunities are fewer than summer and restricted to a smaller area, impacts to sensitive wildlife species are possible from activities such as skiing, ski area development, and snowmobiling. Species groups that may be affected by winter recreation are the forested group (American marten, boreal owl, and northern goshawk), the grassland group (ferruginous hawk), the riparian/wetland group (bald eagle and river otter), and the alpine group (Rocky Mountain bighorn sheep and white-tailed ptarmigan). In general, the application of LRMP design criteria, referenced guidance, and BMPs is expected to ensure that impacts to wildlife from program activities would be minimized during times of important life functions. Use of these design criteria during project-level planning would help minimize impacts to sensitive species, but impacts from existing recreation (skiing and snowmobile use) are still possible.

While the actual direct impacts from different types of recreation use are similar for all alternatives, the amount of area potentially impacted varies by alternative, primarily because of differences in the number of acres that would be designated as suitable for motorized use. Alternative A has the most area

designated as suitable for motorized travel over snow and would provide the most suitable motorized acres on the mountain passes. Alternative D has the second highest amount of area designated as suitable for motorized recreation, followed by Alternative B. Alternative C has the fewest number of acres designated as suitable for motorized recreation, and therefore has the potential to impact sensitive wildlife species on the fewest number of acres.

Those species listed above are likely to be the most impacted from human disturbance associated with winter recreation, as they are more sensitive to human disturbance and remain active during the winter. Habitat loss and alteration from newly developed ski areas or newly designated recreation areas may occur; however, effects for these activities vary and would be analyzed at the project level.

## **Solid Mineral Development**

Currently on the SJNF, some small-scale solid mineral development is possible in alpine habitat around Silverton and in a variety of terrestrial ecosystems around the Rico and La Plata areas. Small-scale rock collecting is also possible in many areas across the SJNF. Solid mineral development may have negative effects to sensitive wildlife species that occur in the project areas where mining or rock collecting are most likely to occur. Potential negative effects are expected to be associated mostly with small-scale habitat loss or alteration, and for most species, temporary displacement resulting from human disturbance and development activities.

The number of acres available for solid minerals development varies by approximately 10,000 acres between alternatives. Alternative C has the fewest number of acres open to locatable mineral development and the highest number of acres proposed for withdrawal, and thus would have the least amount of potential impact on sensitive wildlife species. Alternative B has more acres available for mineral development and fewer acres proposed for withdrawal as compared to Alternative C. Alternatives A and D have the most acres available for locatable mineral development and do not propose the withdrawal of any additional areas from mineral development, and would therefore have the most potential to impact sensitive wildlife species. The number of acres currently withdrawn from possible solid mineral development is the same for each alternative. Solid mineral development may have impacts to sensitive species in all analysis groups.

There are several design criteria requiring that projects or activities occurring in habitat for sensitive species be designed to reduce negative effects to habitat or minimize disturbance effects to species. Design criteria applicable to solid mineral development include those listed for sensitive butterflies, bats, bighorn sheep, and sensitive raptors. Additional design may be included during project-level analysis and implementation. In addition, federal authority over mining activities allows for the setting of terms and conditions in operating plans in order to minimize impacts to public lands. There are also areas that have been withdrawn from leasing or are administratively unavailable for leasing that would not be affected by solid mineral development. Currently, there are 424,428 acres on the SJNF that have been withdrawn from leasing. In addition, the opportunity for new solid mineral development within the roughly 566,000 acres of CRAs is somewhat limited because new road construction is prohibited, unless there is a prior existing right. The design criteria in the LRMP, the withdrawal of areas from leasing, and the limited opportunity for solid mineral development in CRAs all combine to minimize negative effects of solid mineral development on sensitive wildlife species.

#### **Timber Harvest**

Timber management and harvesting is an important tool for managing ecosystem diversity, forest insect and disease populations, tree growth and yields, recreation settings, wildlife habitat, wildfire hazard mitigation. The timber and fuels programs would be integrated to meet overlapping common goals. The timber program would focus treatments in following areas:

- landscapes in the wildland urban interface that have altered fire regimes and/or have areas with high fuel loadings;
- landscapes at high risk for developing epidemic levels of insect and/or disease infestation;
- landscapes where disturbance (such as fire, or insects/disease) has resulted in dead or dying trees;

- areas where vegetation management could most effectively move age classes, size classes, density, and species closer to desired conditions;
- areas treated previously in order to maintain sustainable conditions and to improve scenic integrity; and
- areas where wood processing facilities can effectively and economically use products resulting from vegetation management.

Timber harvest treatments would occur in ponderosa pine, warm-dry mixed conifer, cool-moist mixed conifer, aspen, and spruce-fir forests. Treatment in ponderosa pine and warm-dry mixed conifer would be via restoration treatments (a form of partial cut where post-harvest residual density is partially or closely tied to HRV) and partial cutting (includes single-tree and group selection, improvement cuts, shelterwood, and other partial-cut harvesting methods, generally removing 30% or less of the existing overstory). Treatment in cool-moist mixed conifer and spruce-fir include partial cutting. Treatment in aspen would include clear cutting and coppice. Coppice is a method of regenerating a stand in which the majority of regeneration is from stump sprouts, or in the case of aspen, root suckers. Vegetation would be treated via traditional timber harvest methods such as chainsaw, feller-buncher, or similar equipment via land based systems. Treatments would occur when ground conditions are conducive for operating heavy equipment and other motor vehicles, generally summer through winter.

Timber harvest treatments under Alternative D would affect the vegetation and soils on approximately 3,400 acres per year, followed by Alternative A at 2,150 acres and Alternative B at 2,100 acres. Alternative C would affect the vegetation and soils on the fewest acres per year at 1,580 acres. While Alternatives A, B, and C would affect the vegetation and soils on fewer acres, there would also be less opportunity under these alternatives to use timber harvest treatments for ecosystem restoration purposes than under Alternative D. As noted in the Table T.11 harvest treatments would occur over a relatively small amount of each vegetation type over the life of the LRMP, and therefore potential effects (positive and negative) to sensitive species would occur at a relatively small scale. Treatments would affect sensitive species in the forested and riparian/wetland analysis groups. Direct and indirect effects from timber harvest treatments are discussed by treatment in each vegetation type.

Disturbance impacts resulting from use of mechanized equipment and construction and/or reconstruction of roads to access treatment units are common effects associated with all sensitive species. Disturbance impacts would vary by species as some species are less affected, while others such as northern goshawk are likely to be most affected given their general intolerance to human disturbances. The construction and/or reconstruction of roads would occur to access treatment units, directly impacting additional habitat for species. Roads also serve as a means of public transportation (permitted and non-permitted) thereby indirectly impacting species by causing disturbance, and in some areas of high usage, reduced habitat effectiveness. LRMP and project-specific design criteria would be applied to minimize disturbance impacts to goshawk and other species sensitive to human disturbance.

## Ponderosa Pine

Timber harvest treatments in ponderosa pine would focus on restoration treatments and affect habitat for forested sensitive species including fringed myotis, hoary bat, Townsend's big-eared bat, flammulated owl, Lewis' woodpecker, northern goshawk, and olive-sided flycatcher. Treatment would include primarily thinning of ponderosa pine to decrease stand densities, with the primary objective of enhancing forest health. The health and vigor of residual trees would increase after treatment due to the increased uptake of soil and moisture nutrients. Treatments would also increase resiliency of ponderosa pine forests to insects, disease, and high-intensity wildfire.

Restoration treatments would have short-term negative effects and long-term positive effects. For all species, short-term effects include temporary displacement due to disturbance. Where thinning of trees particularly within clumps occurs, roosting habitat for species such flammulated owl and hoary bat, and potential nesting habitat for goshawk would be negatively affected. Negative effects to key habitat components such as snags used by olive-sided flycatcher for perching posts, northern goshawk for plucking posts, and flammulated owl and Lewis' woodpecker for nesting would be minimized with application of LRMP design criteria for snag retention and recruitment.

Restoration treatments are expected to have many positive effects to sensitive species in the long-term through the enhancement of structural characteristics preferred by the species. All species are associated with more open, park-like stand conditions with clumps and groups of mostly even-aged trees (of varying size classes) and small openings dispersed throughout treatment areas. These structural characteristics provide foraging, nesting/roosting, and security habitat for all species. Clumps provides roosting and security for hoary bat, flammulated owl, and northern goshawk. Small grass-forb openings interspersed among clumps and groups of trees provide foraging habitat for fringed myotis, hoary bat, Townsend's big eared bat, flammulated owl, Lewis' woodpecker, and northern goshawk. The combination of treatment and the likelihood of prescribed burning post-treatment would reduce the risk of high-intensity wildfire, thereby maintaining more sustainable ponderosa pine habitat in the long-term.

Treatment in ponderosa pine via partial cutting methods utilizing individual tree and group selection would have similar effects to species as restoration treatments. Partial cutting methods utilizing even-aged cutting methods such as shelterwood treatments would be more impacting to sensitive species as negative effects to structural characteristics preferred by the species are expected to be greater.

# Warm-dry Mixed Conifer

Timber harvest treatments in warm-dry mixed conifer forests would have similar effects to species as those described for ponderosa pine harvest treatments.

# Aspen

Timber harvest treatments in aspen would focus on partial cutting treatments and affect habitat for forested sensitive species including fringed myotis, hoary bat, flammulated owl, Lewis' woodpecker, northern goshawk, olive-sided flycatcher, and purple martin. Treatment would focus on aspen regeneration in combination with aspen release. Where aspen is intermixed with conifer, white fir, and other conifer species encroaching into mature aspen stands would be targeted for removal to help reduce competition and release existing aspen regeneration. Pure stands of live and decadent aspen may also be harvested to promote suckering of aspen regeneration.

Treatment in aspen/conifer forests would reduce a minor amount of potential nesting habitat for flammulated owl and northern goshawk until trees of sufficient size are present to provide cavity-nesting opportunities (flammulated owl) or stick nest placement (northern goshawk). At the same time, treated areas would provide foraging habitat for both species residing in adjacent stands, as well as other species that forage in the newly created openings. Treatment in aspen with conifer areas would result in significant aspen sprouting and regeneration. Maintaining aspens presence in treated areas would maintain prey diversity for goshawks and other forest dwelling raptors, and provide breeding (flammulated owl, Lewis' woodpecker, purple martin, and fringed myotis) and foraging habitat (all species) as stands develop and reach maturity.

Treatment in aspen-dominated stands would have similar effects to sensitive species as those described above.

#### Cool-moist Mixed Conifer

Timber harvest treatments in cool-moist mixed conifer would focus on partial cutting treatments and affect habitat for forested sensitive species including American marten, flammulated owl, northern goshawk, and olive-sided flycatcher. All species are associated with mature and late successional cool-moist mixed conifer forests due to the structural characteristics and habitat attributes present (large trees, multi-story stands, moderate to high canopy closures of 40% and greater, snags, and downed woody material) that provide suitable habitat for nesting/denning, foraging, and security. Harvest treatments that negatively affect structural characteristics and key habitat attributes can negatively affect sensitive species.

Many of the cool-moist mixed conifer stands across the SJNF are in mature or older stages of development, and many are being affected by insects and disease. Uneven- and even-aged silvicultural treatments would be used to treat areas affected by insects and disease, and areas that are high risk of developing epidemic levels of insects and disease. In general, uneven-aged silvicultural treatments

(individual tree and group selection) tend to result in fewer short- and long-term negative effects to structural characteristics when compared to even-aged treatments (shelterwood cuts). Structural characteristics are not expected to be appreciably affected in the short or long term by either silvicultural treatment, as both treatments would target trees reflecting poor health, and, to a lesser extent, healthy trees. Healthy trees would be removed in some locations to reduce stand densities and multi-story structure preferred by insects such as western spruce budworm (*Choristoneura* sp.), and disease such as *Armillaria* and other root rot diseases. Insects and disease are common disturbance agents of cool-moist mixed conifer forests. Trees that are weakened or killed by insects and disease provide habitat for wildlife; however, their habitat value is far greater when they exist in forests containing an abundance of healthy trees, as healthy trees provide other requirements. Because treatments would be designed to improve forest health, long-term effects to species are expected to be mostly positive, and more sustainable habitat is expected in the long-term.

Either silvicultural treatment can have negative effects to habitat attributes such as snags used for cavity nesting (flammulated owl), foraging (olive-sided flycatcher), and perching (northern goshawk). Snags are also used by bird and small prey species of northern goshawk and American marten such as woodpeckers, jays, and ground squirrels. Treatments can also affect small mammal prey such as voles, red squirrels, and snowshoe hare for American marten and northern goshawk that utilize downed material for forage and cover. Negative effects to downed woody material may occur during felling operations and during use of mechanized equipment for skidding logs to landings, or during the construction or reconstruction of roads in treatment units.

Treatment in areas affected by insects and disease are not expected to appreciably impact forested sensitive species as endemic populations of insects and disease would remain following treatment, continuing their role as natural disturbance agents and continue influencing structural characteristics and maintaining habitat attributes utilized by sensitive species. Negative effects to snags and downed woody material would be minimized with application of LRMP and project-specific design criteria that retain sufficient number of snags and course woody debris in treated areas.

In areas where insects and disease have fewer impacts to cool-moist mixed conifer forests, treatment would occur to move age classes, size classes, density, and species closer to desired conditions. Short-and long-term effects to structural characteristics and habitat attributes are expected to be similar to those described above.

## Spruce-fir

Timber harvest treatments in spruce-fir would focus on partial cutting and affect habitat for forested sensitive species including American marten, boreal owl, northern goshawk, and olive-sided flycatcher. All species are associated with mature and late successional spruce-fir forests due to the structural characteristics and habitat attributes described previously for cool-moist mixed conifer. Harvest treatments that negatively impact structural characteristics and key habitat attributes can negatively affect sensitive species.

Many of the spruce-fir stands across the SJNF are in mature or older stages of development, and many of them are being affected by insects and disease, especially spruce bark beetle. Uneven- and even-aged silvicultural treatments would be used to treat areas affected by insects and disease, and areas that are high risk of developing epidemic levels of insects and disease. In areas where insects and disease are having fewer impacts to spruce-fir forests, treatment would occur to move age classes, size classes, density, and species closer to desired conditions.

Short- and long-term effects to American marten, northern goshawk, and olive-sided flycatcher are expected to be similar to those described for cool-moist mixed conifer. Effects to boreal owl are expected to be similar to marten, goshawk, and olive-sided flycatcher, as they all utilize and are associated with the same structural characteristics and habitat attributes described under cool-moist mixed conifer.

## Riparian/Wetlands

Timber harvest treatments are not intended for riparian and wetland areas; however, direct and indirect effects may occur. The use of mechanized equipment in riparian areas is possible, but most likely limited to accessing treatment areas. Travel through riparian areas to access treatment units may result in negative effects to soils and riparian vegetation. Other negative effects may result from off-site activities that disturb upland soils, and the potential transfer of eroded material into riparian/wetlands, thus affecting riparian vegetation. These negative effects are expected to be minimized with application of LRMP and project-specific design criteria for watersheds. With application of design criteria, negative effects to sensitive species in the riparian/wetland analysis group are expected to be minimal.

# 1.3.2 Summary of Direct and Indirect Effects

The wide variety of sensitive species and their preferred habitats suggests that all LRMP alternatives have potential for some affect to sensitive species or their preferred habitats. Effects could be positive, negative, or neutral depending on the species and habitats affected. LRMP alternatives that emphasize more ground-disturbing activity in or near primary habitat areas for sensitive species (such as nesting sites, roosting sites, production areas, and wintering areas) would have a greater potential for impact to some sensitive species or increase the intensity of impacts to some sensitive species.

The potential for influential impacts and disturbances would vary widely among sensitive species and between the alternatives. LRMP implementation activities that occur in close proximity to active breeding and young-rearing areas and other important habitats, such as roosting or wintering areas, would be more likely to have impacts of greater intensity and on a wider variety of sensitive species.

The potential for impact, as well as the potential need for adjustment and monitoring of project effects to some sensitive species and their key habitat components, is likely to be greatest under Alternative D. The potential for impacts to sensitive species is likely to be least under Alternative C and is likely to be similar between Alternatives A and B. The differences between alternatives would be due to the greater projected outputs under Alternative D and acres available for timber harvest, the available livestock animal unit months (AUMs), fluid minerals development scenarios, and greater acres suitable for summer motorized travel. Alternative D would also have a larger amount of land area available for active management activities that may, in turn, impact habitats for sensitive species, movements of individuals, and the potential for human disturbance to species or their key habitats or use areas.

For recreation and associated travel management, Alternatives B, C, and D would eliminate cross-country motorized use. Eliminating cross-country motorized travel and limiting motorized travel to a system of designated routes would substantially reduce the potential for disturbance to sensitive species, compared to the potential for disturbance in areas of unrestricted cross-country travel that would remain available under Alternative A.

For livestock grazing, impacts to species associated with riparian areas, wetlands, and spring and seep habitats would be greatest under Alternative D because it proposes the most acres as suitable for livestock grazing, followed by Alternatives A and B, which propose relatively similar acres as suitable for grazing, then Alternative C, which proposes the least acres as suitable for livestock grazing.

For timber harvest in lower elevation forests such as ponderosa pine and warm-dry mixed conifer where some sensitive species are most abundant on the SJNF, Alternative C proposes the fewest acres of timber harvest, followed by Alternatives A and B, which project the same acres of timber harvest, then Alternative D, which projects the most timber harvest. Timber harvest activities may cause some temporary impacts to individuals in harvest activity areas, but restoration treatments are expected to be beneficial in the mid- to long-term (5–10 years or more).

For fuels treatments (mechanical and prescribed fire), there is little difference between the LRMP alternatives in projected activity outputs in ponderosa pine and mixed conifer forests. Some temporary impacts to individuals may occur during project implementation, but long-term effects (10 years or more) on habitats for sensitive species are expected to be primarily beneficial through movement of ecological conditions closer to those expected under HRV.

Application of LRMP design criteria and management recommendations from referenced documents and manuals during project design and implementation should ensure that the scale of impact is minimized and the intensity of effects is reduced to the extent possible. In general, the distribution of habitat components and habitat diversity across the planning area would be guided by land capability and HRV. The habitats affected by LRMP implementation would vary somewhat in distribution, depending on the alternative selected. LRMP components relating to management of landscape connectivity areas, forest structural stage and canopy cover objectives, retention of snags and downed woody debris, and maintenance of wetlands and water-dependent features would maintain habitat capability for some sensitive species.

## 1.3.3 Cumulative Effects

Human populations near the SJNF have increased over the last 100 years and are projected to continue growing in the foreseeable future. This trend, and the associated increased demand for a wide variety of forest products and recreational opportunities across the SJNF, may be one of the largest wildlife management challenges facing LRMP implementation.

Actions taken to implement any of the alternatives, along with past, present, and reasonably foreseeable future activities undertaken by the SJNF or other ownerships, may result in cumulative impacts to sensitive species. However, all alternatives would be limited by LRMP components designed, in part, to account for potential cumulative impacts of activities occurring on adjacent ownerships, or from the combined effects of all program activities on lands managed by the SJNF. LRMP components are expected to provide the ecological conditions necessary to maintain populations of all species well distributed across the SJNF. LRMP components that address species and wildlife diversity are also founded in law, federal regulation, and policy that allows for periodic reviews and adjustments of the LRMP, as needed and as new information becomes available.

No LRMP alternative is expected to result in any appreciable cumulative impacts to detect changes in population or habitat trends. Plan monitoring requirements and adaptive management principles are expected to help identify changes in sensitive species populations and habitat trends on the SJNF and guide decisions about the potential need for management changes to address unanticipated cumulative impacts over the life of the LRMP.

## 1.3.4 Determination

In consideration of the direct, indirect, and cumulative effects analysis, and management direction in the LRMP for alternatives, implementation of the LRMP for the SJNF may impact individual sensitive species but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing or loss of species viability range wide. The BE incorporates applicable management direction from the LRMP designed to aid in the management and conservation of sensitive species. In addition to the species-specific design criteria mentioned at the beginning of the BE, the LRMP contains over 100 components, including additional design criteria, objectives, and desired conditions, that are meant to help provide for the ecological conditions in key habitat types necessary for all species.

Two species, the New Mexico meadow jumping mouse and the Western yellow-billed cuckoo are involved in litigation settlement with USFWS. These species are in review with the USFWS and could become Federally listed as proposed species with proposed critical habitat prior to a FS Plan decision notice and FS Agency approval in meeting the scheduling process outlined in the settlement. There is no currently known suitable habitat or species occupation for the yellow-billed cuckoo on SJNF. There is also no known occupation by the jumping mouse. The only known possibly suitable jumping mouse habitat is

isolated on the SJNF and not within distances to known populations where natural dispersal and colonization could result. Without confirmed breeding, known populations, or individuals on SJNF, management actions under the preferred alternative are not likely to jeopardize the continued existence of either species and conferencing is not required. If proposed critical habitat is designated on SJNF for either species, conferencing will be triggered if further review indicates that management actions proposed under the LRMP would destroy of adversely modify proposed critical habitat.

# 2 BUREAU OF LAND MANAGEMENT SENSITIVE WILDLIFE SPECIES ANALYSIS

# 2.1 Introduction

This appendix contains the sensitive species analysis for BLM sensitive species—plants, fish, and terrestrial wildlife. BLM policy states that actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of BLM sensitive species. BLM sensitive species would be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under ESA (BLM 6840 Manual).

# 2.2 Sensitive Species Considered and Evaluated

Table T.12: Bureau of Land Management Sensitive Species and Habitat Associations for the Tres Rios Field Office

Sensitive Species	Habitat Association or Vegetation Type
Birds	
American bald eagle	Forested stands around aquatic settings
Haliaeetus americanus	
American bittern	Marsh, swamp, or bog with cattails, rushes, grasses, and sedges
Botaurus lentiginosus	
American peregrine falcon	Breeds on cliffs, often in association with riparian areas; regular breeder on
Falco peregrinus anatum	theTRFO
Black swift	Vertical rock faces near waterfalls or in dripping caves
Cypseloides niger	
Brewer's sparrow	Primarily sagebrush but also in mixed shrublands (rabbitbrush, greasewood,
Spizella breweri	etc.)
Columbian sharp-tailed grouse	Oak/Serviceberry shrublands, often interspersed with sagebrush; aspen
Pediocetes phasianellus	forests; irrigated pasture; recently reintroduced near Dolores, not expected
columbianus	for other units
Ferruginous hawk	Grasslands and semi-desert shrub; not known to breed but a regular winter
Buteo regalis	resident on the TRFO
Gunnison sage-grouse	Sagebrush grasslands
Centrocercus minimus	
Northern goshawk	Ponderosa pine, aspen, mixed conifer, and spruce-fir forests
Accipiter gentiles	
Western burrowing owl	Prairie dog colonies with vacant burrows; grasslands, shrublands, deserts
Athene cunicularia	Discrimental and the second section of the second sections
Western yellow-billed cuckoo	Riparian; gallery cottonwoods with dense understory
Coccyzus americanus	Encolorate manches would adopt imported land
White-faced ibis	Freshwater marshes, pond edges, irrigated land
Plegadis chihi Incosts	
Great Basin silverspot butterfly Riparian; mostly tied to springs	
Great Basin silverspot butterfly (Nokomis fritillary butterfly)	Riparian, mostly fied to springs
Speveria nokomis nokomis	
speyer ia nokomis nokomis	

Sensitive Species	Habitat Association or Vegetation Type
Mammals	
Allen's big-eared bat <i>Idionycteris phyllotis</i>	Mountain areas, canyons, forested habitats, limited in arid areas
Big free-tailed bat Nyctinomops macrotis	Rocky landscapes, high cliff faces
Desert bighorn sheep Ovis canadensis nelsoni	Rocky canyons, grass, low shrub, open habitat with adjacent steep rocky areas for escape and safety
Fringed myotis  Myotis thysanodes pahasapensis	Pinyon-juniper and other coniferous woodlands
Gunnison's prairie dog Cynomys gunnisoni	Grasslands and semi-desert and montane shrublands
New Mexico meadow jumping mouse Zapus hudsonius luteus	Mesic grass/forb/sedge riparian habitat
North American wolverine <i>Gulo gulo</i>	Rare; boreal spruce-fir forest and tundra
Spotted bat Euderma maculatum	Pinyon-juniper, shrub desert, possibly riparian
Townsend's big-eared bat Corynorhinus townsendii	Abandoned mines and caves
AMPHIBIANS	
Boreal toad Bufo boreas boreas	Damp conditions; marshes, wet meadows, streams, ponds, lakes
Canyon tree frog Hyla arenicolor	Intermittent or permanent streams and pools in deep rocky canyons
Northern leopard frog Rana pipiens	Water's edge; wet meadows, banks of marshes and ponds
REPTILES	
Desert spiny lizard Sceloporus magister	Shrub-covered dirt banks and sparsely vegetated rocky areas near flowing streams or arroyos
Longnose leopard lizard Gambelia wislizenii	Flat or gently sloping shrublands with a large percentage of open ground and includes mesa tops above canyons

# 2.3 Sensitive Species Evaluations

All sensitive species known to occur or suspected to have habitat on the Tres Rios Field Office (TRFO) are evaluated below. They are grouped by mammals, birds, insects, amphibians, reptiles, fish, and plants. This information is based on the most current scientific information available, including species assessments, monitoring plans, conservation assessments and plans, and recovery plans.

## 2.3.1 Mammals

## Allen's Big-eared Bat

# Natural History and Background

Allen's big-eared bat (*Idionycteris phyllotis*) occurs in southwestern United States to central Mexico (Adams 2003). This species can be expected in extreme southwestern Colorado (Fitzgerald et al. 1994). The species has been reported on BLM lands near Dolores where it has been detected using canyon habitat along the Dolores River. The biology of this species is poorly known. The species inhabits mountainous areas and is commonly found in pine-oak forested canyons and in coniferous forests. It has been found in low elevation ponderosa pine forests, pinyon-juniper woodlands, occasionally in high-elevation white fir forests, and areas with narrow leaf cottonwood (Adams 2003). The species forms day

roosts in rock crevices, caves, and mines, and therefore typically prefers areas associated with cliffs, outcrops, or boulder piles. The species has been found roosting under loose tree bark of ponderosa pine. It is not known how this species uses tree roosts. It is thought there is a strong correlation to the use of caves, mines, and crevices. For the purpose of this analysis, the BLM assumes use of snags, caves, mines, and crevices for roosting.

The greatest threat to this bat is thought to be human disturbance of roost sites and especially hibernacula and maternity colonies (Arizona Game and Fish Department 1993; Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, fuels treatments, timber harvest, and destruction of buildings and bridges used as roosts (Western Bat Working Group 1998).

Past management activities that may influence the habitat for this species have not changed significantly over the life of the LRMP. Abandoned mine reclamation has focused efforts on identifying resources used by bats and modifying design criteria to keep mines open to bat use. Fuels and timber activities most likely have removed roosting habitat for Allen's big-eared bat, however the scale of activity compared to available habitat has not raised any habitat conservation concerns in the planning area. This species may make significant use of natural crevices within rock faces for various life cycles across the planning area. Planning activities have not impacted these habitats due to the inaccessibility of the sites. The majority of oil and gas activities throughout the planning area have been localized to known developing fields. Minimal loss of roosting habitat may have occurred through the clearing of snags for drilling activities.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the Allen's big-eared bat involve fluid minerals development, wildlife management (i.e., abandoned mine closures), and possibly fuels treatment and timber management activities. Fuels and timber treatments may impact this species through the direct removal of roosting habitat and modification of habitat across the landscape.

Oil and gas development has the potential for direct and indirect impacts through loss of habitat and direct loss of individuals. If roosting snags are within a proposed development the loss of the roost may temporarily displace individuals. The most apparent threat is loss of individuals through entrapment in drilling, production pits, and production equipment. In an unpublished study by the USFWS in Indiana, "hundreds of dead birds and bats were found in oil pits in counties with Indiana bat summer habitat" (USFWS, Bloomington Field Office, unpublished data, 1993–1994). Krutzsch (1948) found the pooling oil from oiling roads attracted volant desert animals. Three bats were among the animals removed from small pools of oil. Finley et al. (1983) documented mortalities in a sludge pit near Rifle, Colorado. A total of 27 bats was found in one sludge pit.

Timber and fuels management would continue across all alternatives, only at varying levels. The impacts from timber and fuels management may result in the direct loss of individuals if a roost tree is removed during a project. Because the Allen's big-eared bat is known to day roost in ponderosa pine, impacts to the species could occur if the planned activities result in reductions in these components. Conversely, restoration activities that include thinning of small dense trees might benefit the foraging patterns of many bat species. The scale of treatments across all alternatives makes any impacts miniscule when compared the amount of available habitat.

## Alternative A: No Action

#### Direct/Indirect Effects:

The species is extremely rare in Colorado, with no breeding sites or important habitat elements found. Impacts to these areas are therefore unlikely and cannot be predicted or measured at this time.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to

leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. Alternative A offers similar timber management treatments across all alternatives. Lands suitable for timber production vary by 2% to 5% across all alternatives. Several LRMP components also focus on snag management and retention, and although impacts would occur they are anticipated to be minor.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could negatively influence potential roost structures if snags are fire hardened, removed, or burned.

Alternative A provides the same wildlife management actions in regards to mine closures with bat gates as opportunities arise. Thus, all alternatives install the same quantity and quality of mine closure bat gates over the life of the LRMP.

In general, Alternative A offers a slightly higher risk of negative influences on some potential habitat components for the Allen's big-eared bat, such as snags, because it allocates a greater amount of area to active management scenarios. Impacts are expected to be minimal because abandoned mines and cave habitat have standards and guidelines across all alternatives that target important underground roost sites for closure and protection. The ability of this species to use multiple roosts increases the likelihood that adequate habitat would be available throughout the planning area. LRMP components are also expected to reduce impacts to snags and other vegetation where active management occurs.

## Action Alternatives: Alternatives B-D

#### Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and Guidelines that protect the habitats of Allen's big-eared bat do not vary throughout alternatives. Acres allocated for development may be altered by alternative, with Alterative C designating more lands for natural or unique landscapes or processes. Under Alternative C more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower.

Closed loop drilling systems would eliminate the potential for bats to be entrapped in pits. Screening required for production equipment would greatly reduce the potential for bats to be trapped in equipment that bats may identify as potential roost sites.

Surveys for bats prior to mine closures would continue to ensure that abandoned mines beneficial to bats remain open for hibernacula and closed for human safety.

## **Cumulative Effects:**

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation on Allen's big-eared bat are not known at this time. Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the Reasonable Foreseeable Development (RFD) scenario.

In regards to past, current, or reasonably foreseeable vegetative changes that may have influenced the Allen's big-eared bat, its primary habitat types have most likely been altered from historic conditions. Fire suppression and timber harvest activities have resulted in structural changes in ponderosa pine forests as compared to historic conditions. It is therefore likely that potential snag roosts have also been reduced. It is not likely that snag roosts are a limiting factor for Allen's big-eared bat due to the ability of this species to use multiple roost throughout its life history.

Although some management trends on private lands have recently changed, it is likely that the majority of mature stands and habitat values for bats and other wildlife species would remain and occur primarily on public lands. The focus of these lands under all alternatives involves restoration activities such as thinning, fuel reductions, and prescribed fire intended to help return these cover types to a more historic condition.

## **Big Free-tailed Bat**

## Natural History and Background

Big free-tailed bat (*Nyctinomops macrotis*) occurs from the southwestern United States to south-central Mexico (Adams 2003). Individuals and roost sites are present in the western canyon country of Colorado, in particular along the Dolores River in Montrose County (Adams 2003).

The species has been reported on BLM lands near Dolores where it has been detected using canyon habitat along the Dolores River. This species prefers rocky landscapes, roosting high on cliff faces (Adams 2003). It also uses buildings for day roosts and occasionally roosts in tree cavities. Maternity roosts have been documented in rock crevices, with long-term use of the crevice reported (Navo 2003). As with other bats human disturbance to roost sites appear to be an important factor. Disturbance to maternity roosts from June through August may be detrimental. For the purpose of this analysis the BLM assumes the use of snags, caves, mines, and crevices for roosting.

The greatest threat to this bat is thought to be human disturbance of roost sites, especially hibernacula and maternity colonies, through recreational caving and mine exploration (Arizona Game and Fish Department 1993; Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, fuels treatments, timber harvest, and destruction of buildings and bridges used as roosts (Western Bat Working Group 1998).

Past management activities that may influence the habitat for this species have not changed significantly over the life of the LRMP. Abandoned mine reclamation has focused efforts on identifying resources used by bats and modifying design criteria to keep mines open to bat use. Fuels and timber activities most likely have removed roosting habitat for big free-tailed bat; however, the scale of activity compared to available habitat has not raised any habitat conservation concerns in the planning area. This species may make significant use of natural crevices within rock faces for various life cycles across the planning area. Planning activities have not impacted these habitats due to the inaccessibility of the sites. The majority of oil and gas activities throughout the planning area have been localized to known developing fields. Minimal loss of roosting habitat may have occurred through the clearing of snags for drilling activities.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the big free-tailed bat involve fluid minerals development, wildlife management (i.e., abandoned mine closures), and possibly fuels treatment and timber management activities. Fuels and timber treatments may impact this species through the direct removal of roosting habitat and modification of habitat across the landscape.

Oil and gas development has the potential for direct and indirect impacts through loss of habitat and direct loss of individuals. If roosting snags are within a proposed development, the loss of the roost may temporarily displace individuals. The most apparent threat is loss of individuals through entrapment in drilling and production pits. In an unpublished study by the USFS in Indiana, "hundreds of dead birds and

bats were found in oil pits in counties with Indiana bat summer habitat" (USFWS, Bloomington Field Office, unpublished data, 1993–1994). Krutzsch (1948) found the pooling oil from oiling roads attracted volant desert animals. Three bats were among the animals removed from small pools of oil. Finley et al. (1983) documented mortalities in a sludge pit near Rifle, Colorado. A total of 27 bats was found in one sludge pit.

Timber and fuels management would continue across all alternatives, only at varying levels. The impacts from timber and fuels management may result in the direct loss of individuals if a roost tree is removed during a project. Because the big free-tailed bat is known to day roost in ponderosa pine, impacts to the species could occur if the planned activities result in reductions in these components. Conversely, restoration activities that include thinning of small dense trees might benefit the foraging patterns of many bat species. The scale of treatments across all alternatives makes any impacts miniscule when compared the amount of available habitat.

## Alternative A: No Action

#### Direct/Indirect Effects:

The big free-tailed bat is currently known to occur sporadically on the far western portion of the TRFO. Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. Alternative A offers similar timber management treatments across all alternatives. Lands suitable for timber production vary by 2% to 5% across all alternatives. Several LRMP components also focus on snag management and retention, although impacts are anticipated to be minor.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could negatively influence potential roost structures if snags are fire-hardened, removed, or burned.

Alternative A provides the same wildlife management actions in regards to mine closures with bat gates as opportunities arise. Thus, all alternatives install the same quantity and quality of mine closure bat gates over the life of the LRMP.

In general, Alternative A offers a slightly higher risk of negative influences on some potential habitat components for the big free-tailed bat, such as snags, because it allocates a greater amount of area to active management scenarios. Impacts are expected to be minimal because abandoned mines and cave habitat have standards and guidelines across all alternatives that target important underground roost sites for closure and protection. The ability of this species to use multiple roosts increases the likelihood that adequate habitat would be available throughout the planning area. LRMP components are also expected to reduce impacts to snags and other vegetation where active management occurs.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of big free-tailed bat do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alterative C designating more lands for natural or unique landscapes or processes. Under Alternative C, more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower.

Closed loop drilling systems would eliminate the potential for bats to be entrapped in pits. Screening required for production equipment would greatly reduce the potential for bats to be trapped in equipment that bats may identify as potential roost sites.

Surveys for bats prior to mine closures would continue to ensure that abandoned mines beneficial to bats remain open for hibernacula and closed for human safety.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation on the big free-tailed bat are not known at this time. Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

In regards to past, current, or reasonably foreseeable vegetative changes that may have influenced the big free-tailed bat, its primary habitat types have most likely been altered from historic conditions. Fire suppression and timber harvest activities have resulted in structural changes in ponderosa pine forests as compared to historic conditions. It is therefore likely that potential snag roosts have also been reduced. It is not likely that snag roosts are a limiting factor for big free-tailed bats due to the ability of this species to use multiple roosts throughout its life history.

Although some management trends on private lands have recently changed, it is likely that the majority of mature stands and habitat values for bats and other wildlife species would remain and occur primarily on public lands. The focus of these lands under all alternatives involves restoration activities such as thinning, fuel reductions, and prescribed fire intended to help return these cover types to a more historic condition.

## **Desert Bighorn Sheep**

# Natural History and Background

The historic range of the desert bighorn is thought to include southwest Colorado (Monson 1980) and large areas of suitable habitat within the TRFO are present. Important habitat requirements for desert bighorn sheep include topographical diversity of vertical cliffs and sandstone rims, escape terrain with areas of high visibility with good forage and water sources nearby. Terrain is typically rough, rocky, and broken by canyons and washes, with steep slopes used for lambing and predator avoidance. Bighorns are social animals, using grouping as a predator defense mechanism (Bleich et al. 1997) and preferring open habitats for feeding to enhance predator detection and avoidance. Escape terrain is particularly critical to ewes and ewe-lamb groups, to the extent that those groups would sacrifice forage quality to obtain higher security from predators (Bleich et al. 1997; Shackleton et al. 1999). Desert bighorn utilize a variety of vegetation ranging from grass and shrub communities to pinyon-juniper woodlands, generally avoiding areas of dense vegetation and poor visibility. Water availability can influence distribution patterns for individuals and some herds.

There are two desert bighorn sheep populations currently present in the TRFO, the middle Dolores River population and the upper Dolores River population. Both populations in the planning area are the result of reintroductions by CPW in the 1980s, and the populations are closely managed. CPW has monitored these populations in recent years with global positioning system (GPS) radio collars and has collected more precise habitat use and survival data for these populations. There has also been evidence that individuals from the two populations would travel down or up the river corridor to the other population.

The upper Dolores population is located on BLM lands primarily between Mountain Sheep Point and Burro Canyon near Slickrock Bridge on Highway 141. However, there have been observations reported both below and above this general geographic area. This section of the Dolores River is composed of steep vertical cliffs with a mix of pinyon-juniper and mixed shrub vegetation. This area receives considerable recreational river traffic during high flow years and from public using this area via all-terrain

vehicle, horseback, bicycle, and foot travel throughout the other warm weather months. A section of the Dolores River in the core of this population is seasonally closed to vehicular traffic between February 1 and June 30 to protect critical habitat during the lambing period for the desert bighorn sheep.

The middle Dolores population is located in the geographic area between gypsum gap and paradox valley and is typically defined as the area encompassed by the Dolores River wilderness study area (WSA). This population has also been documented to travel widely outside of the protected WSA throughout the year.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the desert bighorn sheep involve fluid minerals development, motorized and non-motorized recreation, and potentially livestock grazing. In particular, the potential conflict with domestic sheep if they were ever proposed for grazing in desert bighorn sheep habitat.

Though there is the potential for competition of forage between desert bighorn sheep and livestock, the limited timing and placement of the livestock would have little impact to the overall habitat for the bighorn sheep. These populations would continue to be annually monitored to ensure conflicts that could be detrimental to this species are not occurring as a result of the Proposed Action. Currently there are no active domestic sheep allotments located within, or near, the desert bighorn populations in the TRFO. Bighorn sheep species are especially vulnerable to the influence of infectious diseases that have been documented in domestic sheep, and the effects these diseases could have to population performance and species abundance is considerable.

Oil and gas development has the potential for direct and indirect impacts through loss of habitat and fragmentation of habitat near both of these populations. The middle and upper Dolores populations are almost entirely located in a WSA and within a protected river corridor, which is unavailable for surface occupancy by oil and gas development. However, these populations are not exclusive to habitat within these protected areas and there is the potential for oil and gas expansion near these populations. Some of the potential direct effects from development near these populations include disruption of movement corridors and other critical use areas.

Timber and fuels management would continue across all alternatives, only at varying levels. The impacts from timber and fuels management would be minimal to the desert bighorn populations within the TRFO. Fuels management and the removal of timber in occupied habitat would likely benefit the desert bighorn sheep due to the removal of predator cover and the increase in visibility for the desert bighorn.

Recreation would likely continue to present in occupied desert bighorn habitat in all alternatives. Both populations are located in areas that receive considerable river recreation traffic during the spring runoff. These impacts are thought to have minimal overall impacts to desert bighorn sheep. Motorized traffic has been limited in the upper Dolores River population during critical lambing periods. The Dolores River corridor is being proposed as a Special Recreation Management Area (SRMA) under the proposed alternative, which could prioritize recreational activities in desert bighorn sheep habitat in the future.

#### Alternative A: No Action

## **Direct/Indirect Effects:**

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. The slight increase in available leased lands could negatively impact desert bighorn sheep over time.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could have an overall beneficial impact to desert bighorn sheep in that an increase of forage and a reduction in predator cover would result.

Alternative A provides the same wildlife management actions in regards recreational impacts in bighorn sheep habitat.

In general, Alternative A offers similar management to what is currently in place and has allowed these populations to be successful.

### Action Alternatives: Alternative B-D

## **Direct/Indirect Effects:**

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of bighorn sheep do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alternative C designating more lands for natural or unique landscapes or processes. Under Alternative C more habitats would be managed for less development, and habitat fragmentation across the planning area may be slightly lower. Increased development in bighorn sheep habitat under any of the action alternatives could have an overall negative impact to this species. Site-specific analysis of potential impacts would be analyzed and mitigated at the project level.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation and the disturbance from oil and gas development on bighorn sheep are not well known other than the direct loss of suitable habitat. Alternatives A through D include both current and projected new leases; the "no new lease" scenario only includes current leases under each of the Alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

The specific LRMP components that have been developed for bighorn sheep and existing regulations are expected to alleviate any potential cumulative effects and contribute to favorable habitat conditions for any individual desert bighorn sheep that occur within the TRFO.

## **Fringed Myotis**

## Natural History and Background

The fringed myotis ranges throughout western North America, from British Columbia southward into Mexico (Adams 2003). Fringed myotis roost in crevices, buildings, underground mines, rocks, cliff faces, and bridges. Roosting in decadent trees and snags, particularly large ones, is common throughout its range in western United States and Canada. Fringed myotis roosts have been documented in a large variety of tree species and it is likely that structural characteristics (e.g., height, decay stage), rather than tree species, play a greater role in selection of a snag or tree as a roost.

The species is particularly susceptible to human disturbances, especially near maternity colonies (O'Farrell and Studier 1980, cited in Adams 2003). Hibernation has only been documented in buildings and underground mines (Bradley and Ports 2003). The species is known to migrate, but to what extent is unclear.

The greatest threat to this bat is thought to be human disturbance of roost sites, especially hibernacula and maternity colonies, through recreational caving and mine exploration (Arizona Game and Fish Department 1993; Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. It is likely that if White Nose Syndrome were found in Colorado, this species may not be as impacted as cave-obligate species. Other threats include closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying,

vegetation conversion, fuels treatments, timber harvest, and destruction of buildings and bridges used as roosts (Western Bat Working Group 1998). Disturbance or destruction of water sources and riparian habitat may also influence fringed myotis habitat use (NatureServe 2013).

Past management activities that may influence the habitat for this species have not changed significantly over the life of the LRMP. Abandoned mine reclamation has focused efforts on identifying resources used by bats and modifying design criteria to keep mines open to bat use. Fuels and timber activities most likely have removed roosting habitat for fringed myotis; however, the scale of activity compared to available habitat has not raised any habitat conservation concerns in the planning area. This species may make significant use of natural crevices within rock faces for various life cycles across the planning area. Planning activities have not impacted these habitats due to the inaccessibility of the sites. The majority of oil and gas activities throughout the planning area have been localized to known developing fields. Minimal loss of roosting habitat may have occurred through the clearing of snags for drilling activities.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the fringed myotis involve fluid minerals development, wildlife management (i.e., abandoned mine closures), and possibly fuels treatment and timber management activities. Influences from fuels and timber treatments would be limited to the lower-elevation habitat types where the fringed myotis may potentially occur. Fuels and timber treatments may impact this species through the direct removal of roosting habitat and modification of habitat across the landscape.

Oil and gas development has the potential for direct and indirect impacts through loss of habitat and direct loss of individuals. If roosting snags are within a proposed development the loss of the roost may temporarily displace individuals. The most apparent threat is loss of individuals through entrapment in drilling and production pits. In an unpublished study by the USFWS in Indiana, "hundreds of dead birds and bats were found in oil pits in counties with Indiana bat summer habitat" (USFWS, Bloomington Field Office, unpublished data, 1993–1994). Krutzsch (1948) found the pooling oil from oiling roads attracted volant desert animals. Three bats were among the animals removed from small pools of oil. Finley et al. (1983) documented mortalities in a sludge pit near Rifle, Colorado. A total of 27 bats was found in one sludge pit.

#### Alternative A: No Action

#### Direct/Indirect Effects:

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Alternative A offers similar timber management treatments across all alternatives. Lands suitable for timber production vary by 2% to 5% across all alternatives. Several LRMP components also focus on snag management and retention, but impacts are anticipated to be minor.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could negatively influence potential roost structures if snags are fire-hardened, removed, or burned.

Alternative A provides the same wildlife management actions in regards to mine closures with bat gates as opportunities arise. Thus, all alternatives install the same quantity and quality of mine closure bat

gates over the life of the LRMP. This action could be quite beneficial to the fringed myotis because it readily roosts in abandoned mines.

In general, Alternative A offers a slightly higher risk of negative influences on some potential habitat components for the fringed myotis, such as snags, because it allocates a greater amount of area to active management scenarios. Impacts are expected to be minimal because abandoned mines and cave habitat have standards and guidelines across all alternatives that target important underground roost sites for closure and protection. The ability of this species to use multiple roosts increases the likelihood that adequate habitat would be available throughout the planning area. LRMP components are also expected to reduce impacts to snags and other vegetation where active management occurs.

## Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in alternative A. Standards and guidelines that protect the habitats of fringed myotis do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alterative C designating more lands for natural or unique landscapes or processes. Under Alternative C, more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower.

Closed loop drilling systems would eliminate the potential for bats to be entrapped in pits. Screening required for production equipment would greatly reduce the potential for bats to be trapped in equipment that bats may identify as potential roost sites.

Surveys for bats prior to mine closures would continue to ensure that abandoned mines beneficial to bats remain open for hibernacula and closed for human safety.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation on fringed myotis are not known at this time. Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

In regards to past, current, or reasonably foreseeable vegetative changes that may have influenced the fringed myotis, its primary habitat types have most likely been greatly altered from historic conditions. Fire suppression and timber harvest activities have resulted in structural changes in ponderosa pine forests as compared to historic conditions. It is therefore likely that potential snag roosts have also been reduced. It is not likely that snag roosts are a limiting factor for fringed myotis due to the ability of this species to use multiple roost throughout its life history.

Although some management trends on private lands have recently changed, it is likely that the majority of mature stands and habitat values for bats and other wildlife species would remain and occur primarily on public lands. The focus of these lands under all alternatives involves restoration activities such as thinning, fuel reductions, and prescribed fire intended to help return these cover types to a more historic condition.

## **Gunnison's Prairie Dog**

## Natural History and Background

Gunnison's prairie dogs are distributed from central Colorado to central Arizona, including southeast Utah and much of the northwestern half of New Mexico (NatureServe 2013). In Colorado, the species is restricted to the southwest and south-central portions of the state. They range in elevation from 6,000 to 12,000 feet. They are well distributed across the TRFO at lower elevations.

Gunnison's prairie dogs inhabit grasslands and semi-desert and montane shrublands (Fitzgerald et al. 1994). Habitat use by Gunnison's prairie dogs differs somewhat from the black-tailed prairie dog primarily due to the strikingly different geographical settings within the range distribution of these species. The black-tailed prairie dog is primarily a prairie species, while the Gunnison's prairie dog is associated with intermountain valleys, benches, and plateaus that offer prairie-like topography and vegetation. These intermountain valleys, benches, and plateaus can range from very arid to mesic sites. Gunnison prairie dogs can occupy mesic plateaus and higher mountain valleys, as well as arid lowlands (Knowles 2002). The species is generally found in groups of several individuals, oftentimes forming colonies. They dig burrows that are used for raising young and providing cover from predators.

Gunnison's prairie dogs hibernate. In central Colorado around 10,000 feet, individuals enter burrows by October and emerge in mid-April. Hibernation periods at lower elevations are shorter and some individuals may even appear above ground in winter months (Fitzgerald et al. 1994).

Predators include badgers, golden eagles, coyotes, bobcats, and red-tailed hawks. Plague and poisoning have caused considerable retraction of the species in parts of Colorado and New Mexico (Fitzgerald et al. 1994). In Colorado, prairie dogs are considered small game species and are provided no protection from harvest. The primary activities that have influenced Gunnison's prairie dogs in Colorado involve intentional poisoning and plague (Fitzgerald et al. 1994). Recreational shooting may also influence local prairie dog populations in some locations. Recreational shooting of prairie dogs is controlled and managed by CPW and not influenced by the LRMP alternatives.

Past management activities that may have impacted Gunnison's prairie dog include mineral development, ROW authorizations, and road construction.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence Gunnison's prairie dog primarily involve fluid minerals development, seismic exploration, road construction/reconstruction, ROWs, summer motorized recreation, and range management activities (i.e., livestock grazing and associated activities). Outbreaks of plague are density-dependent occurrences that are not influenced by any of the LRMP revision alternatives, and poisoning is not permitted without additional analysis. Surface-disturbing activities such as seismic activity and ROW authorizations (pipelines, power lines, roads, etc.) may disturb habitat and temporarily displace individuals during construction. Burrows adjacent to proposed activities may collapse as a result of construction equipment within the ROW.

#### Alternative A: No Action

#### Direct/Indirect Effects:

The exact locations of fluid minerals development are not known at this time. However, potential development areas do overlap the range of Gunnison's prairie dog, so some influences or impacts could be possible.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. NSO stipulations do not apply specifically for Gunnison's prairie dog; however, the species may benefit from stipulations applied for the management of other species (i.e., burrowing owl). Under the No Leasing Alternative, development would be limited to existing leases within the planning area.

It is likely that winter travel is not a major influence on prairie dogs because the species hibernates while that activity is occurring. In regards to summer motorized travel, Alternative A offers more suitable acres for this activity than in any of the action alternatives. Although summer travel probably causes no direct impacts to prairie dog colonies, motorized travel near the colonies may disturb the species or disrupt their foraging habits.

Under Alternative A, no standards or guidelines exist to limit activity outside the breeding season. Young too small to escape construction equipment may be killed. Impacts during hibernation may be similar to impacts during breeding and rearing of young. Arousal during hibernation may result in the loss of fat reserves needed for individuals to make it through winter months. Individuals not displaced during hibernation may be killed by equipment or suffocate if burrows were to collapse.

## Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

As with Alternative A, the action alternatives would have no influence over the control of plague outbreaks and no additional authority over state actions involving recreational shooting. Poisoning of prairie dogs is not allowed under any alternative without additional analysis.

As noted in effects common to all alternative, there is slight variation in acres of leasing and stipulations across Alternatives B, C, and D. There is only a 2% difference in leased acres in Alternatives B and C. Alternative C opens the fewest acres to leasing and has the highest percentage of leased acres with NSO stipulations. Lease stipulations limit timing of activity such that no surface-disturbing activity may occur from March 1 to July 15 on occupied Gunnison's prairie dog colonies. Lease stipulations also require that special modifications be made to minimize disturbance of active burrows. There are no restrictions on construction during hibernation. Historic and foreseeable development levels are such that any loss of individual prairie dogs during construction would not have any impact on the overall population of Gunnison's prairie dogs.

Impacts from seismic, ROWs, and other surface-disturbing activities do not differ across Alternatives B, C, and D.

The action alternatives offer fewer suitable acres for summer motorized travel. Consistent with the theme of minimizing human influences, Alternative C is the most restrictive. All action alternatives provide potential benefits because of greater controls on off-road travel. Greater indirect benefits to prairie dogs may therefore be associated with the action alternatives.

Changes in permitted livestock in the action alternatives are not expected to have much influence on Gunnison's prairie dog because of generally neutral interactions between the two. However, if cattle are providing indirect benefits to prairie dogs because of grazing influences, this might be reduced in Alternative C. Overall, however, no detectable differences are expected.

#### Cumulative Effects:

Gunnison prairie dog colonies have been greatly reduced from historic numbers because of influences such as intentional poisoning and introduced plague. Recreational shooting has probably impacted localized populations in some areas. Intentional poisoning has been greatly reduced over time but still may continue on private lands. On public lands, however, this activity is strictly controlled. Plague outbreaks remain a primary factor influencing Gunnison's prairie dogs in Colorado.

Some planned activities on the TRFO may influence existing prairie dog colonies. While Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the Alternatives. Overall, however, the TRFO remains a refuge for the prairie dog and planned activities are expected to have little influence on their persistence. Planned activities are not expected to contribute to any negative cumulative effects on the species habitat or populations.

## **New Mexico Meadow Jumping Mouse**

## Natural History and Background

The New Mexico meadow jumping mouse is one of three species of *Zapus* found in North America. This subspecies, *luteus*, is endemic to the American Southwest where it is known as disjunct Pleistocene relic populations (Frey 2008). This mouse is recognized as a federal candidate species by the USFWS. The USFWS identified the following counties as areas where the species is known or believed to occur: Archuleta, Conejos, Costilla, La Plata, Las Animas, and Montezuma.

The subspecies is known to occur from sites in eastern Arizona, New Mexico, and extreme southern Colorado. The meadow jumping mouse is not currently known to occur on BLM lands. It has been found on private lands at lower elevations in general proximity to TRFO.

This species is found in moist grasslands and meadows, often along the edges of marshes and near free-flowing water (Morrison 1990). In habitat studies by Frey in New Mexico, the species is restricted to complex riparian habitats. Very good habitat was deemed those areas with very dense vegetation cover over 3 feet high, with grasses and forbs dominating the areas where the species was found (Frey 2005). The jumping mouse appears to only utilize two riparian community types: 1) persistent emergent herbaceous wetlands (i.e., beaked sedge [Carex utriculata] and reed canarygrass [Phalaris arundinacea] alliances) and 2) scrub-shrub wetlands (i.e., riparian areas along perennial streams that are composed of willows and alders) (Frey 2005:53).

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the New Mexico meadow jumping mouse primarily involve road construction/reconstruction, summer motorized recreation, and range management activities (i.e., livestock grazing and associated activities). Oil and gas development should not have any impacts on this species or it habitat since under land use planning standards and guidelines no surface-disturbing activities are allowed in riparian areas. Road construction could potentially remove habitat; however, this is a remote possibility since most riparian stream crossings have been established for decades.

Livestock grazing in riparian areas could modify habitat for the New Mexico meadow jumping mouse. Habitat on BLM lands for this species is located mostly along the Dolores River. There is limited habitat for this species in the proposed Snaggle Tooth lands with wilderness characteristics. Currently no active allotments are permitted within the proposed Snaggle Tooth lands with wilderness characteristics and grazing should have no impact on this species. The New Mexico meadow jumping mouse currently is not known to occur on BLM lands in the planning area.

## Alternative A: No Action

#### Direct/Indirect Effects:

Grazing impacts under the No Action Alternative would be the same as described in effects common to all alternatives. Under the No Action Alternative, habitat along the Dolores River would not receive any protection under lands with wilderness characteristics. New development would be allowed under this alternative. It is not very likely that any new development would occur along the Dolores River corridor due to the location of the area and limited potential for development.

## Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

Grazing impacts under the No Action Alternative would be the same as described in effects common to all alternatives. Under Alternatives B and C habitat for this species would be restricted from development due to the potential for being classified as lands with wilderness characteristics. Under Alternative D habitat along the Dolores River would not receive any protection under lands with wilderness characteristics or any other special designations. New development would be allowed under Alternative

D. It is not very likely that any new development would occur along the Dolores River corridor, regardless of designation, due to the location of the area and limited potential for development.

#### **Cumulative Effects:**

Impacts to this species and its habitat would continue on private surface regardless of alternatives chosen in the LRMP. Cumulative impacts to this species or habitat is not likely to change among any of the alternatives due to the low potential for development of the habitat. Grazing has the highest potential of any resource to influence habitat conditions for this species. Currently there are no active grazing permits for any allotments that may contain habitat for this species.

## **North American Wolverine**

## Natural History and Background

The wolverine is the largest member of the family *Mustelidae*, which also includes weasel, fisher, marten, badger, and mink. Wolverines are found in small numbers throughout their range and appear to require large expanses of wilderness or remote areas.

Historically, its North America range included Alaska, most of Canada, the Great Lakes region (in small numbers), with peninsular extensions into the northern Midwest (North and South Dakota and Nebraska), the Rocky Mountains as far south as northern New Mexico, and the Pacific coastal ranges through central California. The status of the wolverine in Colorado is undetermined, with 22 records representing 25 animals between 1871 and 1919 (Seidel et al. 1998). Since 1979, 12 investigations have been conducted in Colorado with the goal of trying to document wolverine presence in the state (Seidel et al. 1998). After intensive efforts using snow tracking, hair snags, remote cameras, and snares, only 10 sets of tracks were found that appeared to have a high probability of being wolverine (Seidel et al. 1998). One of those investigations occurred on NFS lands of the planning area but no evidence of wolverine was found.

Wolverines are a wide-ranging species, and thus use a wide variety of habitats. Habitats fragmented by high road densities, heavy timber management, urbanization, etc., appear to be avoided (Banci 1994).

A significant body of evidence suggests that large remote tracts of higher elevation lands are necessary for wolverine populations (Banci 1994; Hornocker and Hash 1981; Seidel et al. 1998). Any activities that increase human presence or result in significant alteration of habitats in and adjacent to these limited areas may degrade their overall ability to support wolverine populations. In addition, linkages between these areas must be maintained if self-sustaining populations of wolverines can persist (Banci 1994). Other limiting factors include low reproductive potential, low-density populations, availability of natal and maternal dens, prey availability, predation, trapping, and parasites. Disturbance at any time of year can cause displacement. However, disturbance in proximity to natal sites or disrupting natal activities (January–March) can lead to abandonment of the den (Heinemeyer and Copeland 1999).

Habitat for wolverine on BLM lands in the TRFO is limited to the Silverton area. The Silverton area is heavily developed and experiences substantial recreation use. Given the remote possibility that a population of wolverines inhabits the San Juan Mountains, and due to the secretive nature of this species, it is highly unlikely wolverines would inhabit BLM lands in this area.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the wolverine primarily involve road construction/reconstruction, motorized and non-motorized recreation, and ski area development. The Silverton area has the only habitat on the BLM with any potential for the occurrence of wolverine. It is extremely unlikely that a wolverine would be found in the Silverton area due their avoidance of disturbance and people. Silverton experiences high levels of recreation during the summer, with approximately 300,000 visitors annually.

## Alternative A: No Action

#### Direct/Indirect Effects:

Management of recreation does not change through Alternatives B, C, and D. Effects to wolverine are the same as in the effects common to all alternatives.

### Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

Management of recreation does not change through Alternatives B, C, and D. Effects to wolverine are the same as in the effects common to all alternatives.

## Cumulative Effects:

Cumulative impacts across all alternatives would have the same cumulative effects. A considerable amount of wilderness and unfragmented habitat remains in the San Juan Mountains, and recreational use on BLM lands has increased to a point that previously undisturbed areas are now supporting various types of extreme sports and other recreational pursuits. These activities, as well as ski areas associated with some alternatives, have the potential to reduce the amount of solitude habitat available for species such as the wolverine.

Timber harvest and fuels reduction activities would continue on NFS and private lands within habitat for wolverine. BLM and USFS wildlife programs in coordination with CPW would continue to monitor for the presence of wolverines.

## **Spotted Bat**

## Natural History and Background

The spotted bat occurs from south-central British Columbia to southern Mexico. In Colorado, spotted bats occur in the western semi-desert canyonlands (Armstrong et al. 1994). Spotted bats have been found in a variety of habitats; however, rocky cliffs are necessary to provide suitable cracks and crevices for roosting, as is access to water (Fitzgerald et al. 1994). The species roosts by day in rock crevices located on high cliffs (Adams 2003). The dependency of rock-faced cliff roosting habitat limits the spotted bat to very small geographic areas with specific geologic features (Luce 2004). Foraging has been observed in forest openings, pinyon-juniper woodlands, large riverine/riparian habitats, riparian habitat associated with small to mid-sized streams in narrow canyons, wetlands, meadows, and agricultural fields (Western Bat Working Group 1998).

Historically, the spotted bat has endured little impact from human disturbance because its roosts are remote. Recreational rock climbing may disturb bats in local situations (Luce 2004). Large-scale pesticide programs to control Mormon crickets (*Anabrus simplex*) and grasshoppers could affect this species by reducing the availability of prey (Luce 2004). Disturbance to hibernacula in the winter months during temperature extremes could be limiting.

Past management activities that may influence the habitat for this species have not changed significantly over the life of the LRMP. Abandoned mine reclamation has focused efforts on identifying resources used by bats and modifying design criteria to keep mines open to bat use. This species is thought to be an obligate of natural crevices within rock faces and planning activities have not impacted these habitats due to the inaccessibility of the sites. The majority of oil and gas activities throughout the planning area have been localized to known developing fields.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the spotted bat primarily involve minerals development and recreational rock climbing. Rock climbing could disturb the species if climbing activities happened to disturb roosting individuals within rock crevices. However, there is no information that rock climbing is a risk to the species and assessing that activity would be purely speculative at this time.

Oil and gas development has the potential for direct impacts through loss of individuals foraging near oil and gas development. The most apparent threat is loss of individuals through entrapment in drilling and production pits. In an unpublished study by the USFWS in Indiana, "hundreds of dead birds and bats were found in oil pits in counties with Indiana bat summer habitat" (USFWS, Bloomington Field Office, unpublished data, 1993–1994). Krutzsch (1948) found the pooling oil from oiling roads attracted volant desert animals. Three bats were among the animals removed from small pools of oil. Finley et al. (1983) documented mortalities in a sludge pit near Rifle, Colorado. A total of 27 bats was found in one sludge pit.

### Alternative A: No Action

#### Direct/Indirect Effects:

The spotted bat is a desert species that is currently known to occur sporadically on the far western portion of the planning area. Its range could therefore overlap planned activities such as oil and gas development in the Paradox Basin. This overlap would primarily involve activities planned within the Paradox Basin.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Because the spotted bat primarily roosts in rock crevices in high cliff faces, it is unlikely that impacts to primary reproductive or roosting habitat would occur. If overlaps did occur, however, there may be a greater risk of impact to this species because it appears to reuse tradition rock crevice roost sites regularly (Wai-Ping and Fenton 1989). The species also does not appear to utilize mines or caves.

Benefits to this species could occur from water pond developments associated with livestock grazing. This activity has the potential to create valuable drinking water sites important to many bat species. Potential benefits are expected to be similar in all alternatives.

## Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of spotted bats do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alterative C designating more lands for natural or unique landscapes or processes. Under Alternative C, more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower.

Closed loop drilling systems would eliminate the potential for bats to be entrapped in pits. Screening required for production equipment would greatly reduce the potential for bats to be trapped in equipment that bats may identify as potential roost sites.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation on spotted bats are not known at this time. Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

Recreational climbing would continue throughout the life of the LRMP. Recreational climbing is not expected to result in any measureable impacts to spotted bat populations or their habitat since spotted bats are relatively solitary.

## Townsend's big-eared bat

## Natural History and Background

Townsend's big-eared bat occurs throughout much of western North America, with some isolated populations in the eastern United States (Adams 2003). One of the largest winter roost sites in Colorado was found in the early 1990s at a patented mine on the Mancos-Dolores District of the SJNF. CPW biologists currently monitor the site. Elsewhere, CPW volunteers conducted exit counts and trapped bats at various abandoned mines in La Plata Canyon during the early 1990s. No Townsend's big-eared bats were recorded during these surveys, nor have there been any other confirmed reports of this species elsewhere on the planning area.

Physical habitat, especially the presence of caves or mines suitable for day and night roosting and for hibernation, is probably more important than the vegetative characteristics (Armstrong et al. 1994). Roosting habitats consist most frequently of caves and abandoned mines, but also include buildings, bridges, rock crevices, and hollow trees. They do not move long distances from hibernacula to summer roosts nor do they move or forage far from their day roosts. During the summer, single individuals may be encountered hanging in cracks of cliffs.

The primary threat from LRMP decisions are disturbance or destruction of roost sites caused by recreational caving, mine reclamation, and renewed mining in historical districts. This species is sensitive to disturbance and has been documented to abandon roost sites after human visitation. Disturbance to hibernacula in the winter months during temperature extremes may be critical. Both roosting and foraging habitats may be affected by timber harvest practices. In addition, pesticide spraying in forested and agricultural areas may affect the prey base (Western Bat Working Group 1998). The impacts of White Nose Syndrome on this species are not currently known at this time. Townsend's big-eared bats are cave-obligate species and introduction of White Nose Syndrome into their environment would most certainly be detrimental to populations in Colorado.

Past management activities that may influence the habitat for this species have not changed significantly over the life of the LRMP. Abandoned mine reclamation has focused efforts on identifying resources used by bats and modifying design criteria to keep mines open to bat use. Fuels and timber activities most likely have not influenced foraging habitat characteristics for Townsend's big-eared bats in any measurable levels. The majority of oil and gas activities throughout the planning area have been localized to known developing fields.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence Townsend's big-eared bat primarily involve fluid minerals development and wildlife management (i.e., abandoned mine closures). Although big-eared bats may occasionally utilize some trees as day roosts, it is primarily a cave-dwelling bat and this analysis would focus on that important habitat component.

Oil and gas development has the potential for direct and indirect impacts through loss of habitat and direct loss of individuals. If roosting snags are within a proposed development the loss of the roost may temporarily displace individuals. The most apparent threat is loss of individuals through entrapment in drilling and production pits. In an unpublished study by the USFWS in Indiana, "hundreds of dead birds and bats were found in oil pits in counties with Indiana bat summer habitat" (USFWS, Bloomington Field Office, unpublished data, 1993–1994). Krutzsch (1948) found the pooling oil from oiling roads attracted volant desert animals. Three bats were among the animals removed from small pools of oil. Finley et al. (1983) documented mortalities in a sludge pit near Rifle, Colorado. A total of 27 bats was found in one sludge pit.

Abandon mine closures would continue at the same level across all alternatives. All closures are surveyed for bat activity prior to mine closure. Any mines with bat activity are closed to human access and constructed to be bat friendly and maintain ventilation.

Recreational caving in the planning area is not substantial due to the paucity of known caves.

## Alternative A: No Action

#### Direct/Indirect Effects:

Townsend's big-eared is uncommon on the TRFO but occurs sporadically at lower elevations. Undisturbed cave and mine habitat is the primary limiting factor for this species. Because natural caves could occur in rock formations, it is possible that potential habitat could overlap planned activities such as oil and gas development.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

All alternatives provide the same wildlife management actions in regards to mine closure gates for bats. Thus, all alternatives install the same quantity and quality of mine closure bat gates over the life of the LRMP. These closures are coordinated with CPW and the Colorado Division of Reclamation Mining and Safety and provide undisturbed habitat for mine-associated bat species while also addressing human safety and health issues.

#### Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

There is no difference among the LRMP revision alternatives in regards to implementation of wildlife management activities that may provide bat gates on abandoned mines used by bat species. This activity is expected to provide the highest benefit to Townsend's big-eared bats because they commonly reuse traditional roost and hibernacula. Comparison of impacts from oil and gas development is described above in Alternative A.

## **Cumulative Effects:**

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation on Townsends' big-eared bat are not known at this time. Alternatives A through D include both current and projected new leases, the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

Mine closures would continue for health and human safety. Surveys for bat activity, particularly hibernacula, would provide valuable monitoring for the introduction of White Nose Syndrome in Colorado. White nose syndrome has not been identified in Colorado but continues to move west as the disease spreads. Whether Colorado caves and mines provide the habitat necessary for *Geomyces destructans* (the fungus responsible for White Nose Syndrome) is not known at this time.

## 2.3.2 Birds

# **American Bald Eagle**

## Natural History and Background

The bald eagle is a large bird of prey with a wingspan of approximately 6 to 7 feet. It is brown in color except for the white head and tail. The species is found throughout the United States and Canada primarily near large bodies of water or larger streams and rivers. The winter range of the bald eagle includes most of its breeding range; however, most eagles winter from southern Alaska south to Arizona, New Mexico, and Colorado (USFWS 1998).

Bald eagles feed primarily on fish they catch or take from other fish eating birds. They will feed on waterfowl and other birds, carrion, small to medium-sized mammals, and turtles. They are opportunistic feeders (USFWS 1998). Bald eagles will feed on big game animals that have died on their winter ranges. This carrion provides an important source of food during the winter. Waterfowl, particularly dead or crippled individuals, are an important source of food when fish are not readily available (USFWS 1998).

Loss of habitat and prey sources could reduce populations. The bald eagle is also susceptible to poaching and human disturbance during nesting. The species is recovering from habitat degradation and pesticide related problems. Bald eagles, like the peregrine falcon, are very sensitive to disturbance from the initiation of courtship to young fledging. This time period is roughly from mid-December to mid or late June. During this time period it is extremely sensitive to human disturbance activities and nest abandonment and desertion of long established territories may occur.

Past management activities that may influence this species have not changed significantly over the life of the LRMP. Throughout the majority of the planning time frame bald eagles were managed under the ESA. Once delisted the species was managed with the same conservation measures for 5 years. Mineral development throughout the planning area has been managed in order to avoid nest locations and winter roost sites. All program areas were managed in order to decrease the potential for disturbance at nest and winter roost locations.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence bald eagles include mineral development, recreation, fuels treatments, and timber management. Oil and gas development has the potential for disturbance at the nest location and winter roost sites. Fuels treatments could potentially impact nesting or wintering bald eagles if the disturbance was to occur during timing restrictions within recommend buffers.

To some degree, there are numerous activities and programs that might influence the bald eagle if they occur in nesting areas or within important winter concentration habitat. Most bald eagle nest trees occur near water bodies and are protected and "buffered" from disturbances associated with land use planning decisions.

#### Alternative A: No Action

#### Direct/Indirect Effects:

Fluid minerals management under the No Action Alternative stipulates a 0.25-mile NSO stipulation for active nests and winter roost locations. A 0.25-mile NSO stipulation for nest locations covers 125.6 acres compared to 502.4 acres for a 0.5-mile NSO restriction. The nest and winter roost buffer in Alternative A is 4 times smaller than Alternatives B, C, and D. Based off best available science a 0.25-mile NSO stipulation around active nest and roost locations is not sufficient to protect bald eagles during critical life stages. Development closer than the USFWS recommend 0.5-mile stipulation may lead to nest or roost abandonment.

In regards to activities that could potentially influence the bald eagle, Alternative A offers more acres of active management than Alternative B and C. Because the bald eagle is such an opportunistic forager whose prey species can be influenced by several factors, it is probable that Alternative A has a higher possibility of influencing some aspect of the natural history needs of bald eagles more so than Alternative B or C. Alternative D slightly exceeds Alternative A in active management area acres.

Disturbance from motorized and non-motorized recreation can impact bald eagles at nest sites and in winter concentration areas. Alternative A offers more high-use recreation areas than any of the action alternatives. This difference could potentially allow greater disturbances to bald eagles depending on the type, timing, and scope of the activity. Greater winter travel via snowmobiles could theoretically disturb eagles in winter concentration areas and/or while they are roosting or foraging. Uncontrolled summer motorized activities could add to disturbances around nest sites or summer foraging sites where fish are the primary prey species.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative, development would be limited to existing leases within the planning area.

There are no standards and guidelines in existing planning to limit impacts of fuels around nest locations or winter roost sites. However, management actions are still required to comply with the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. It is not likely that fuels treatments under Alternative A would have any impacts different than other alternatives.

Alternative A could offer a greater risk of impacting the bald eagles than Alternative B and C because it is associated with greater development and fewer strict protective measures. Although direct overlap is unlikely, minimal impacts to individuals cannot be completely discounted because the species may roost or forage near development areas.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Fluid minerals management under Alternatives B, C, and D stipulates a 0.5-mile NSO stipulation for active nests and winter roost locations. The 0.5-mile NSO stipulation is four times larger than the buffer in Alternative A. Development closer than the USFWS recommend 0.5-mile NSO stipulation may lead to nest or roost abandonment.

All action alternatives offer fewer potential disturbances than the No Action Alternative in winter motorized recreation areas because of decreased acres available for motorized use. For summer motorized use, all action alternatives offer more acres available for motorized use than the No Action Alternative and are consistent with their themes in that Alternative C offers the fewest motorized use acres, while Alternative D offers the most acres. Alternative B offers a balance between action Alternatives C and D. Reductions in open motorized areas during winter should decrease the potential for displacement or disturbances to bald eagles during the wintering periods. The increase of acres for motorized use during the summer is mitigated by guidelines set forth in the LRMP that states human encroachment should not occur with 0.5-mile radius of active nests from November 15 through July 15 to reduce disturbance during the nesting season and prevent reproductive failure.

Alternative C offers the fewest acres available for leasing followed by Alternative B. Alternatives A and D are fairly similar and offer the most acres available for leasing. Alternatives B, C, and D offer the most protective lease stipulations with fairly similar acres with NSO, all having significantly more acres than the No Action Alternative. Under the "no new lease" scenario only the existing lease areas have potential for development under these alternatives resulting in fewer acres of potential influence to the species.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent of the impacts of fragmentation on bald eagles is not known. Under the No Leasing Alternative development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

Private surface and development would continue regardless of land use planning decisions. Impacts to bald eagles may continue on private surface. Most resource actions on federal and state surface would have beneficial impacts due to management direction in all alternatives incorporating management standards and guidelines to protect various species and habitats. Even without standards and guidelines for bald eagles cumulative impacts under Alternative A may only differ slightly from Alternatives B, C, and

D due to the requirements for federal agencies to comply with the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

The national mid-winter bald eagle counts confirm other findings that bald eagle populations are increasing across the United States (Steenhof et al. 2002). These increases are highest in the East, Northeast, and upper Midwest, and least in the Southwest. This geographic variation could be due to several factors, including increasingly warmer winters, past insecticide exposure levels by geographic area, and more rapid human population growth in the West and Southwest. The fact that that mid-winter counts of adults increased at almost twice the rate of immatures suggests that the overall trend may reflect past increases in recruitment and that recruitment may be stabilizing (Steenhof et al. 2002). Although minor disturbances to individual bald eagles on the TRFO may occur, no cumulative effects have been identified and the population may be stabilizing to the available habitat and food supply.

# **American Peregrine Falcon**

# Natural History and Background

In the western United States, breeding grounds for the peregrine falcon most commonly occur in mountainous areas near water sources (USFWS 1977). Peregrines prefer sites within 1,300 to 2,300 feet of perennial or ephemeral water (Pagel 1995). The preference for water features in proximity to nest sites is probably associated with the peregrine's prey base (Johnsgard 1990). Cliff structures are most often chosen for nest sites and cliffs are the only sites known in Colorado. On the TRFO and throughout Colorado, breeding territories are found almost exclusively on high walls of tall cliffs in river gorges and along mountainsides (Craig 1986).

Peregrine falcons are primarily aerial hunters of a wide variety of avian species (USFWS 1977). Although small to medium-sized passerines make up the primary diet of peregrines, they may also occasionally take larger prey such as waterfowl (NatureServe 2013). In addition to avian prey, peregrines may rarely take small mammals, such as bats and small rodents, and even lizards (NatureServe 2013).

Limiting factors include limited suitable nesting habitat, prey availability, fragmentation of hunting territories, limited recruitment of young into the population, weather, predation, competition, sensitivity to pesticides, parasites and disease, and sensitivity to human disturbance. Breeding sites on the TRFO are usually occupied March through August.

Past management activities most likely have not influenced this species. The inaccessibility of nest locations removes this species from almost all impacts of management decisions. Guidance has not been developed in previous plans to address the impacts of recreational rock climbing. Most climbing is popular throughout the planning area, however monitoring of peregrine falcon nests has not identified a need to manage this activity.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the peregrine falcon primarily involve motorized and non-motorized recreation (e.g., rock climbing). Riparian management activities could potentially improve prey habitat for the falcon.

## Alternative A: No Action

#### Direct/Indirect Effects:

Recurring occupancy of cliff structures as nest sites on the TRFO suggests that local populations of peregrine falcon could be considered secure. Although nest sites are generally inaccessible to humans, potential disturbance at nest sites are possible.

The peregrine falcon was removed from the endangered species list in 1999. Existing conditions have recovered the peregrine falcon to the point that it has been able to be delisted. Alternative A is expected to continue this trend because most nest sites are inaccessible to human impacts. However, it is possible that Alternative A provides a higher risk of disturbance to individuals because there is more suitable

opportunity land for motorized travel. A higher amount of travel and human activity area could potentially disturb peregrine falcons while they are nesting.

Rock climbing activities also have the potential to disturb falcons if the activity occurs near nest sites. Although rock climbing is a popular sport in the planning area, there is no evidence to suggest that it is currently influencing nest productivity or causing disturbances.

Both Alternative A and B offer the same amount of riparian habitat improvement over the life of the LRMP. These activities may benefit prey species if it occurs in areas where falcons forage. Alternative A does not provide as many acres of watershed improvement as Alternatives C and D.

Alternative A offers a 0.25-mile NSO stipulation for disturbance near nest sites. The disturbance buffer under Alternative A is 0.25 mile and covers 125.6 acres. Should structures be placed outside the 0.25-mile buffer then depending on the nature of the disturbance abandonment of the nest site may occur.

## Action Alternatives: Alternative B-D

## Direct/Indirect Effects:

All action alternatives reduce potential impacts from motorized travel in a similar manner, with most road access restricted to current routes and trails. Although travel impacts to individual falcons may still occur, it is likely that these travel management actions would reduce potential disturbances to nesting falcons.

Potential influences from rock climbing are not expected to be different under the action alternatives. Sitespecific management and protection of nest sites would occur.

Alternative C and D offer slightly more acres of watershed and riparian improvement activities than Alternative B. This could potentially have a slightly greater benefit to prey species if the actions occur near falcon nest sites.

Alternative B, C, and D have a 0.5-mile NSO stipulation that covers 502.4 acres. This buffer is four times larger than the buffer in alternative A.

## **Cumulative Effects:**

At least 31 peregrine eyries were known to occur historically in Colorado. By 1998, however, peregrines in Colorado occupied 90 of 107 known nesting sites. Seventy-six of the sites were occupied by breeding pairs that produced 157 young (USFWS 2003).

The peregrine falcon was delisted on August 25, 1999, as a result of reintroduction efforts and a comeback after the banning of DDT, an insecticide (USFWS 2003). From 1999 through 2001, peregrine falcons were known to occupy 134 territories in Colorado at least once (USFWS 2003). A post-delisting monitoring plan has been developed that would monitor at least 72 of these territories every three years to determine occupancy, nest success, and, if feasible, productivity (USFWS 2003). Some of these sites occur on the TRFO. Recovery of the peregrine falcon is expected to continue with no cumulative effects identified from activities planned on the TRFO.

Cumulative effects under Alternative A would generally have the greatest cumulative impacts because it provides more opportunity for disturbance around nest locations.

#### **Black Swift**

## Natural History and Background

Within the state, the San Juan Mountains have been identified as having the most concentrated occurrences of black swift. This species has the unique characteristic of nesting in colonies on cliffs in close association with mountain waterfalls, often within the spray zone of rushing water. Within the state, the San Juan Mountains have been identified as having the most concentrated occurrences of black swift.

In its mountainous habitats it forages over a range of habitats but is highly specific in its breeding site preference. Nest sites are almost always located on precipitous cliffs near or behind waterfalls (Hunter and Baldwin 1962; Knorr 1961).

Nest sites range in elevation from sea level in California to roughly 11,000 feet in Colorado (Bailey and Niedrach 1965) and occur within a wide range of surrounding habitats. The USFS has identified nine nesting sites across the SJNF and a number of potential sites have been identified but have not been adequately surveyed. No sites have been identified on the TRFO. The black swift is an aerial forager and apparently consumes a wide variety of small flying insectivorous prey. They appear to be attracted to swarms or "blooms" of some insect species.

Limiting factors include changes to microsite characteristics of suitable breeding habitat, small colony size, small clutch size, low regional populations, reproductive success, predation, human harassment, and pesticides. Breeding occurs June through mid-September.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the black swift primarily involve non-motorized recreation (e.g., rock climbing and ice climbing).

#### Alternative A: No Action

#### Direct/Indirect Effects:

Black swift nesting habitat occurs behind perennial waterfalls, often in remote locations. Although rock and/or ice climbing within the spray zone of the waterfall could potentially influence the microsite conditions important to nesting, there is no information that is occurring at any locations. Most nest sites remain highly inaccessible to human alterations. Therefore, no measurable effect is anticipated from the No Action Alternative.

## Action Alternatives: Alternative B-D

### Direct/Indirect Effects:

None of the action alternatives provide additional access to black swift nest sites. The protection offered by their unique nesting habits are expected to continue to discourage any measurable impacts from LRMP revision activities. No effect from any of the action alternatives is anticipated.

#### Cumulative Effects:

The unique nesting habits of the black swift make them practically invulnerable to predators or human disturbance. The young remain protected behind the waterfalls during the day while the adults spend most of the daylight hours on-the-wing foraging high above the forest canopies. Measurable cumulative effects from human activities are therefore unlikely.

## **Brewer's Sparrow**

# Natural History and Background

Brewer's sparrow is an obligate of sagebrush communities (Braun et al. 1976; Paige and Ritter 1999). Throughout most of the Brewer's sparrow's breeding range it is most closely associated with landscapes dominated by big sagebrush (Rotenberry et al. 1999; Wiens and Rotenberry 1981) with an average canopy height of less than 5 feet (Rotenberry et al. 1999). It also occurs in shrubby openings in pinyon-juniper and mountain mahogany woodlands (Sedgwick 1987) and large shrubby parklands within coniferous forests (Rotenberry et al. 1999). Sagebrush in Colorado occurs at elevations of approximately 4,000 to 10,000 feet and exists in a variety of climatic conditions, including low-elevation semi-desert habitats and moist, cool, mountainous areas. Perhaps 30% of Colorado's sagebrush was altered between 1900 and 1974 (Braun et al. 1976), and the ecological integrity of Colorado's sagebrush shrublands has been compromised by the invasion of exotic (e.g., cheatgrass) or native (e.g., pinyon-juniper) plant species, conversion to agricultural, residential, and other developed land types, and changes in natural fire regimes (Biedleman 2000).

The declines in Brewer's sparrow breeding populations are likely linked in part to extensive alteration of sagebrush shrub steppe habitats and impacts on winter habitat. Threats and limiting factors for Brewer's sparrow are habitat loss and fragmentation, agriculture, prescribed burning in sagebrush habitat, oil and gas development, and livestock grazing.

Past management activities that may have influenced this species include sagebrush treatments, fuels reductions, oil and gas development, seismic exploration, and livestock grazing.

Under the current land use plan (Alternative A), the BLM has treated over 2,000 acres of sagebrush habitat in Dry Creek Basin. Sagebrush treatments included mowing, burning, brush beating, and spike treatments. Treatment impacts have ranged from complete loss of sagebrush habitat to short-term reduction in canopy cover.

Historic livestock grazing may have altered sagebrush understory components, and current management is focused on sustainable livestock management.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence Brewer's sparrow primarily involve fuels treatment activities, mineral development, and livestock grazing. Brewer's sparrow occurs most commonly where sagebrush densities are high and contiguous. Even minor declines in sagebrush cover have been shown to result in a similar reduction in breeding pair densities (Holmes 2007). Activities that influence the quality and quantity of sagebrush cover on the TRFO may also have negative influences on this species. Fuels treatments primarily involve hydro-mowing and crushing of mixed shrublands to reduce fuels hazards associated with mature, high-density shrublands. These shrublands are dominated by Gambel oak. Sagebrush may also be affected on a site-specific basis when it coexists with Gambel oak; however, it is not a target species for fuels reduction on BLM lands. Potential impacts to Brewer's sparrow from fuels reduction activities on the TRFO are expected to be minor but cannot be completely discounted.

Oil and gas development has the potential to fragment habitat for Brewer's sparrow. Densities of sagebrush obligates can be expected to decrease due to the loss of habitat and decrease in habitat effectiveness. Ingelfinger and Anderson (2004:392) studied the impacts of oil and gas development on the densities of nesting sagebrush obligates and noted that "[e]ven along roads with light traffic volume (<12 cars per day), density of sagebrush obligates was reduced within 100-m of the road zone." Decreases in density of sagebrush obligates cannot be attributed to traffic alone. Sage sparrows may select against edged created by road and pipeline construction (Ingelfinger and Anderson 2004). Although not statistically significant "[a]long the natural gas pipeline where traffic was absent, Sage Sparrow density was reduced by 64% within a 100-m buffer of the surface disturbance" (Ingelfinger and Anderson 2004:392).

#### Alternative A: No Action

## **Direct/Indirect Effects:**

Brewer's sparrow is a species of conservation concern across much of its western range because of declines in sagebrush habitat and breeding populations. Most suitable habitat on the planning area occurs on lower-elevation BLM lands.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Fuels treatment acres for Alternative A are the same for Alternatives B and C.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

All action alternatives provide for a similar amount of fuels treatment in mixed-shrubland, with a slight increase in Alternative D. Because sagebrush is not a target species for fuels reduction, potential influences on Brewer's sparrow and other sage-associated species are expected to be similar to Alternative A.

Alternative B provides for the same amount of livestock grazing as Alternative A. There is a slight reduction in AUMs and area in Alternative C and a slight increase in Alternative D. The decrease in grazing area and stocking rates in Alternative C may provide some secondary benefits to species such as Brewer's sparrow, while the increase in Alternative D may be associated with a higher degree of habitat impacts to the species. Overall, however, potential impacts are expected to be similar and based on site-specific areas where conservation measures are available to alleviate identified problems. The conservation measures are similar across all alternatives.

Fuels treatments impacts would be the same for Alternatives A, B, and C. Alternative D proposes to treat more acres for fuels. However, the difference between acres treated and available habitat are so minor there is virtually no difference between the alternatives.

## Cumulative Effects:

Some data (Rotenberry and Knick 1999) suggest that Brewer's sparrow populations may be limited by processes occurring on winter range. Brewer's sparrows winter in the extreme southwest United States, but mostly in Mexico. Land use practices, invasion by exotic plants, disrupted ecosystem processes, and altered disturbance regimes have impacted and continue to impact sagebrush ecosystems across the western United States (Knick et al. 2003).

Fuels management may occur in areas, which include small stands of sagebrush but otherwise are dominated by other vegetation types.

Oil and gas development is expected to continue throughout all alternatives. Development levels are projected for each alternative in the RFD scenario. Only under the No Leasing Alternative would oil and gas development be limited to private surface/private minerals.

## **Columbian Sharp-tailed grouse**

## Natural History and Background

The native range of the Columbian sharp-tailed grouse is western Colorado, northeastern Utah, western Wyoming, extreme western Montana, northern Nevada, northwestern California, eastern Oregon, eastern Washington, Idaho, and southeastern British Columbia (Spomer 1987). This grouse does not currently occur on the TRFO and has not been documented on the planning area for more than 30 years (Giesen and Braun 1993). Some suitable habitat may still exist on the SJNF, all on the western part of the forest on the Dolores Ranger District.

In 2004, the Colorado Division of Wildlife (now CPW) reintroduced 40 male sharp-tailed grouse onto private land in southwest Colorado. The reintroduction area involves former agricultural land that is now part of the Conservation Reserve Program. In April 2005, 40 females were also brought from northwest Colorado and released at lek sites that the males had established.

The reintroduced grouse successfully reproduced during the 2005 breeding season, with 14 successful nests out of 17 attempts documented. All of the nests were located in residual grasses on private Conservation Reserve Program lands. As of January 2006, eight females and males (16 birds total) were still being tracked via the transmitters. An additional supplement of mostly females was planned for the spring of 2006. The goal of CPW's Columbian sharp-tailed grouse conservation plan is to establish a breeding population in southwestern Colorado and an additional population on the Uncompangre Plateau. All populations will be tracked by CPW to provide trend information gathered at the leks. It is unknown whether a population will establish from these efforts. Currently, no occurrence has been recorded on BLM lands.

Habitat requirements appear narrower in winter than in summer, and winter distribution is usually in close proximity to mountain shrub and riparian habitats (Giesen and Connelly 1993).

Populations of Columbian sharp-tailed grouse have declined drastically throughout their range since the early 1900s. Increased agricultural development and grazing by domestic livestock are factors influencing abundance and distribution (Hoffman 2001; Meints et al. 1992). Winter dependence on deciduous trees and shrubs for food and cover may limit grouse within sagebrush-steppe habitat (Giesen and Connelly 1993).

Leks are a focal point in management of grouse because disturbances may result in regional population declines (Giesen and Connelly 1993; Rogers 1969). Winter is a critical time period because habitats sufficient for overwintering grouse populations are thought to be limited (Meints et al. 1992).

The Columbian sharp-tailed grouse has been reintroduced to private lands near the TRFO. Although the species is not believed to occur on BLM lands, habitat for the species is available on adjacent BLM-administered lands. As populations recover, it is expected that the grouse would re-occupy some habitats on BLM-administered lands.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the Columbian sharp-tailed grouse primarily involve mineral development, fuels treatment activities, and livestock grazing.

Mineral development may temporarily displace individuals or could cause abandonment of lek sites if development were to occur near lek areas. Development is projected for all alternatives in the RFD scenario. Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Fuels treatments may result in a temporary loss of habitat. These activities are expected to be beneficial to the Columbian sharp-tailed grouse due to a reduction in shrub cover that promotes forage plants such as forbs and grasses that support high insect densities for broods. It should be noted that removal of shrubs in winter habitat may be detrimental to sharp-tailed grouse.

Grazing in sharp-tailed grouse habitat has the potential to reduce nesting cover. Winter habitat may be a potential limiting factor and would be more influenced by big game use than domestic livestock. Heavy use of deciduous trees and shrubs by big game may remove important winter forage for sharp-tailed grouse.

No LRMP activities would have any influence on introduced population of sharp-tailed grouse unless grouse start using BLM lands for breeding or winter habitat.

## Alternative A: No Action

## Direct/Indirect Effects:

In regards to activities that may influence sharp-tailed grouse, Alternative A provides similar fuels treatments in mixed-shrublands and ponderosa pine forest as the action alternatives.

Permitted livestock grazing in Alternative A is 36% of available AUMs. These activities may influence potential grouse habitat because of influences on forage species, insect densities, and other factors.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

All action alternatives provide for a similar amount of potential benefits from fuels treatment activities on potential grouse habitat. Benefits are therefore expected to be similar to Alternative A.

Alternative B provides the same amount of livestock grazing as Alternative A at 36% of available AUMs being permitted. There is a slight reduction in AUMs in Alternative C, where 22% of available AUMs being authorized for grazing, and a slight increase in Alternative D with 40% being permitted. Conservation measures do not change across Alternatives B, C, and D.

## Cumulative Effects:

Introduce sharp-tailed grouse primarily use private Conservation Reserve Program lands but adjacent habitats on the SJNF may become more important to the success of the reintroduction program as the species becomes reestablished. Adjacent BLM lands may be used should populations of sharp-tailed grouse continue to expand.

Oil and gas development would continue on private surface/private minerals regards of LRMP alternative. Development of split estate (private surface/federal minerals) would continue in Alternatives B, C, and D with the same conservation measures across all alternatives. Regardless of overall NSO acres sharptailed grouse lease stipulations do not vary throughout alternatives. In the No Leasing Alternative oil and gas development would be limited to federal minerals with existing leases and private surface/private mineral estate.

Fuels treatments and grazing would continue on federal lands adjacent to sharp-tailed grouse habitat. No cumulative impacts from the effects identified above are anticipated unless sharp-tailed grouse expand into those areas. Current population growth is probably not limited by habitat available to the species but predation, recruitment, and other factors that may be impacting this species population growth rates.

# Ferruginous Hawk

# Natural History and Background

The ferruginous hawk breeds from eastern Washington, southern Alberta, and southern Saskatchewan south to eastern Oregon, Nevada, northern and southeastern Arizona, northern New Mexico, northcentral Texas, western Oklahoma, and Kansas (DeGraaf et al. 1991). The species winters primarily from the central and southern parts of breeding range south to Mexico. In Colorado it is a fairly common to common winter resident on eastern plains and uncommon to rare in western valleys and mountain parks (Andrews and Righter 1992; Preston 1998). It is an uncommon fall and winter resident in southwest Colorado (Durango Bird Club 1992). The TRFO is out of the breeding portion of the species range (NatureServe 2013). Overwintering on the TRFO occurs but is considered uncommon to rare in this portion of the species' range.

Ferruginous hawks primarily inhabit grasslands and semi-desert shrublands, and are rare in pinyon-juniper woodlands (Andrews and Righter 1992; Preston 1998). This species nests in trees and bushes, and on ledges, large rocks, riverbanks, and hillsides (Dechant et al. 2003; Finch 1992). Ferruginous hawks forage on native grasslands where nest sites are scarce, and as a consequence, individuals reuse nest sites until the structures are sometimes over 3 feet in height. Ferruginous hawks hunt from a perch, while soaring, during low, rapid flight over open country, or while systematically searching and hovering at 40 to 60 feet (Dechant et al. 2003; Finch 1992). They feed primarily on rabbits, ground squirrels, and prairie dogs, but would also take mice, rats, gophers, birds, snakes, locusts, and crickets (Dechant et al. 2003).

Limiting factors for ferruginous hawks are nest site and prey availability (Dechant et al. 2003), habitat loss, predation, and human disturbance. On the planning area, its occurrence during the non-breeding season is limited to more open areas that are suitable for hunting and that contain sufficient densities of small mammal prey, such as prairie dogs and ground squirrels, during snow-free seasons. Fall and spring (i.e., during snow-free periods of the non-breeding season) are the most likely time periods this hawk might occur on the TRFO.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the ferruginous hawk primarily involve motorized and non-motorized recreation and mineral development.

### Alternative A: No Action

#### Direct/Indirect Effects:

The ferruginous hawk is a migratory species with individuals that occur sporadically during the winter period. No breeding or nesting pairs are known to occur. Potential affects to this species are therefore most likely limited to possible disturbances from motorized vehicles or recreational activities.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Potential effects from the action alternatives are expected to be similar to the no action. Potential affects to this species are expected to be limited to possible disturbances from motorized vehicles or recreational activities on migratory non-breeding individuals.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

## Cumulative Effects:

The ferruginous hawk has suffered habitat loss and negative effects throughout much of its range in the western United States. However, all of the alternatives associated with the LRMP revision are expected to have no cumulative effects on this species because the planning area does not measurably contribute to the conservation of the species. All individuals are migratory with no important breeding habitats known.

## **Gunnison Sage-grouse**

Gunnison sage-grouse (Centrocercus minimus) is addressed in the Biological Assessment (see Appendix J).

#### Northern Goshawk

## Natural History and Background

The northern goshawk is large-bodied raptor that is holarctic in distribution, meaning it is limited to northern hemispheres. In Colorado, the northern goshawk is considered an uncommon resident in foothills and mountains within the western portion of the state (Andrews and Righter 1992; Barrett 1998a). It is considered to be a winter resident throughout its range, but some individuals winter outside their breeding areas and undertake short-distance migrations (Kennedy 2003). Breeding territories have been found on all Ranger Districts/Field Offices of the planning area and in all forested habitat types. Foraging individuals are regularly seen in a wide variety of habitat types across the planning area.

Goshawks exhibit high breeding territory fidelity from year to year (Kennedy 2003). All montane forest types are used for nesting (Barrett 1998a; Kennedy 2003). Nest areas have a relatively high tree canopy cover and a high density of large trees. Nests are typically located on shallow slopes with northerly exposures or in drainages or canyon bottoms protected by such slopes and are usually within close proximity to water (Barrett 1998a; Reynolds et al. 1992). Nest trees are often the largest trees in the stand and are frequently situated adjacent to breaks in the canopy such as old logging trails or openings created by fallen trees (Hennessy 1978; Kennedy 2003; Reynolds et al. 1992; Shuster 1980). Shuster (1980) also noted a relatively low level of understory vegetation in the general area of the nest site.

Goshawks may select nest sites based on stand structural features, then select an appropriate nest tree (Kennedy 2003). Winter habitat use by goshawks is described as forests, woodlands, shrub lands, and forested riparian strips (Kennedy 2003:).

There are a number of factors cited by researchers and managers as potentially detrimental to current and future goshawk viability. These include, but may not be limited to, habitat alteration, direct human disturbance, pesticides and other contaminants, and harvest for falconry. However, the primary concern throughout the range of the goshawk is habitat alteration due to timber and fire management practices. Additionally, the recent alterations of habitat due to insects and diseases in Colorado has changed goshawk habitat across the state. Prey availability and predation limit goshawk reproduction and recruitment (Kennedy 2003). Density-dependent territoriality may regulate population growth rate (Kennedy 2003). Prey availability affect populations in at least two different ways. First, low prey availability can reduce reproductive output or cause total nest failure (Boal and Mannan 1994). Low prey availability may also result in larger territories, thereby limiting the total number of territories within a given landscape of suitable habitat (Crocker-Bedford 1998; Kennedy et al. 1994). Clonal aspen stands within ponderosa pine and other conifer forest types are often used for nesting and may be important areas for foraging due to higher concentrations and diversity of prey species (Joy 1990; Shuster 1994). Aspen inclusions within pine and conifer forest types used for nesting by goshawks have been lost from the TRFO because of stand aging and lack of disturbance or subsequent regeneration due to fire suppression, and in some cases, browsing by domestic and native ungulates. During winter, prey abundance and not habitat per se may be an important factor in determining goshawk habitat use (Kennedy 2003). The nesting season (April-August) is likely to be the most critical time period and the most vulnerable to disturbance for goshawks on the planning area.

## Effects Analysis

LRMP revision activities that could potentially influence the northern goshawk primarily involve timber harvest, fuels treatments, oil and gas development, and wildlife management activities. Motorized and non-motorized recreation and the development of roads could possibly influence nesting in some locations.

## Alternative A: No Action

#### Direct/Indirect Effects:

Restoration treatments intended to restore the ponderosa pine cover type closer to historic conditions is the primary treatment in Alternative A. These treatments are similar in all alternatives and are intended to help maintain and restore the large tree component required for goshawk nesting substrate over time. These treatments would target small-diameter stands and closed canopy mature stands where density reduction should benefit goshawk foraging patterns. Unless carefully planned, however, density reduction may have negative influences on individual nesting territories. Any treatments that occur during critical nesting periods could potentially displace breeding adults and could impair successful breeding by goshawks.

Treatments in warm-dry mixed conifer stands are also expected to have variable effects on northern goshawks. Where restoration treatments occur, benefits should be similar to those described for ponderosa pine. Where partial cuts occur, variable effects may occur depending on existing stand conditions and the amount of overstory removed. Nesting habitat and/or trees could be reduced in some cases. As discussed above, management activities could impact the breeding success of individual northern goshawks. However, the differences between all alternatives represent a minimal change in this habitat and are not likely to affect the goshawk populations as a whole.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more than 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could have a negative impact to the northern goshawk, depending on the time of year the treatment is occurring. The use of prescribed fire could help restore habitat conditions for the northern goshawk due to a reduction in small-diameter trees that could inhibit effective foraging. The use of prescribed fire is also expected to provide benefits by reducing fuel loads that could result in a high-intensity wildfire that could render habitat unsuitable. Benefits to prey species is also anticipated as small mammals and birds respond to the burn

areas. However, the reduction of course woody debris from fire could temporarily limit habitat for some prey species. Some impacts, such as displacement or nest failure, may occur to individual goshawks if nesting occurs within a prescribed fire area. The use of prescribed fire is projected to occur on approximately 4,000 acres and does not vary across alternatives. Wildland fire use may be used as a management tool on 1 to 30,000 acres of spruce-fir in all action alternatives. This could impact individual goshawks if fire occurs in nesting areas.

Alternative A offers more high-use recreation areas than any of the action alternatives. This difference could potentially allow greater disturbances to nesting goshawks than the action alternatives. As described above, goshawks are especially sensitive to disturbance during critical nesting periods. Nesting success may be affected by the increase in recreation through this alternative.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. Under all alternatives, there are stipulations and mitigation measures in place that would protect critical goshawk habitat and nest territories during critical breeding periods.

Wildlife management activities in ponderosa pine systems in Alternative A do not vary from the action alternatives. These activities are also intended to help restore ponderosa pine closer to historic conditions by understory thinning and other activities that should be beneficial to the northern goshawk. As with timber and fuels treatments, wildlife management activities that occur during critical breeding periods could negatively impact breeding northern goshawks.

#### Action Alternatives: Alternative B-D

### Direct/Indirect Effects:

Overall, the effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of the northern goshawks do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alterative C designating more lands for natural or unique landscapes or processes. Under Alternative C more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower. Increased development in northern goshawk habitat under any of the action alternatives could have an overall negative impact to this species. Site-specific analysis of potential impacts would be analyzed and mitigated at the project level.

There is little difference between the No Action Alternative and Alternatives B, C, and D in regards to predicted outputs and restoration activities in ponderosa pine. As is consistent with the active management theme, Alternative D offers the greatest amount of projected activities in all cover types that may be utilized by the northern goshawk. The slight reduction in harvest outputs in Alternative C and slight increase in Alternative D suggest that potential impacts and disturbances may therefore also vary. Overall, however, all action alternatives are similar and expected to have similar influences on the northern goshawk. Site-specific impacts may occur to individual goshawks in the short term, with long-term benefits anticipated in primary ponderosa pine habitat.

All action alternatives offer fewer potential disturbances than the No Action Alternative from summer motorized recreation because of decreases in the amount of motorized use area. Consistent with their themes, Alternative C offers the fewest motorized acres while Alternative D offers the highest amount of acreage. Alternative B offers a balance between the two other action alternatives, but also provides more undisturbed habitat than Alternative A. Reductions in open motorized areas should decrease the potential for displacement or disturbances to northern goshawks while nesting.

The use of prescribed fire and wildlife management for restoration in ponderosa pine does not vary from the No Action Alternative. Similar benefits and influences are therefore expected. As with Alternative A, it is estimated that wildland fire use may be used as a management tool on 1 to 30,000 acres in all action alternatives. Depending on fire severity and scale, these outputs could have both positive and negative influences on the northern goshawk, depending on the timing of the activity and the proximity to active nests.

Wildlife management activities proposed in the action alternatives to aid in the restoration of ponderosa pine stands do not vary from the No Action Alternative. Similar benefits and influences are expected. However, as stated with Alternative A, wildlife management activities that occur during critical breeding periods could negatively impact breeding northern goshawks.

#### **Cumulative Effects:**

Since the beginning of the last century, the planning area has experienced changes in forest structure caused by timber management, fire prevention, domestic livestock grazing, and other factors. Extensive logging, particularly in the ponderosa pine and mixed conifer types, has created much younger, and often much denser, forests than existed in the pre-settlement era (Romme 1997). The opening of the canopy that results from timber harvest, in combination with fire suppression, has allowed dense shrub layers to develop. These conditions are less suitable for goshawks because of a lower diversity or unavailability of prey species.

The fuels reduction program on the TRFO is using various techniques to restore ponderosa pine to more suitable habitat conditions. These include forest thinnings, mechanical treatments, and controlled burns. All of these techniques reduce understory trees and shrubs and therefore change habitat capability for goshawks. These changes are expected to improve long-term habitat conditions for prey species and make them more accessible to goshawks. As a result, it is expected that cumulative effects would be minimized and long-term benefits for goshawks and their primary prey species would occur while the risks of a high-intensity stand replacement fire are reduced.

Oil and gas development would continue throughout known formations and nesting and foraging may be fragmented. The extent or the impacts of fragmentation and the disturbance from oil and gas development on raptors has been well documented and similar impacts to the northern goshawks in suitable habitat can be anticipated. Alternatives A through D include both current and projected new leases; the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

The specific LRMP components that have been developed for sensitive species and specifically for the northern goshawk are expected to alleviate any potential cumulative effects and contribute to favorable habitat conditions for any individual northern goshawk that occurs within the planning area.

## **Western Burrowing owl**

## **Natural History**

The western burrowing owl is a medium-sized ground-dwelling inhabitant of western grasslands and deserts. It has tendency to nest in loose colonies in underground burrows, which is not only unusual for owls but is quite rare in any other avian species. Although it is primarily nocturnal, it is also quite active during the day, especially during the breeding season.

In Colorado, it is a locally uncommon to fairly common summer resident on the eastern plains, uncommon in the Grande Valley in Mesa County and rare to uncommon in other western valleys and mountain parks. It is considered a casual winter resident on the eastern plains (Andrews and Righter 1992). The species is rare on BLM-administered lands of the planning area. Burrowing owls are known to occur on Gunnison prairie dog colonies in the TRFO.

The burrowing owl uses grasslands and mountain parks, usually in or near prairie dog towns (Andrews and Righter 1992). In Colorado, owls generally select their burrows in areas with other burrows surrounded by bare ground (S.R. Jones 1998). They would often use burrows located within active prairie dog communities and in areas where prairie dog colonies have become inactive owls would discontinue their use when grass reaches 6 inches in height (S.R. Jones 1998). They frequently choose sites close to roads (Plumpton 1992). This owl occasionally becomes urbanized and would breed or forage in vacant areas within urban zones. Little is known about the habitat preferences for migrating owls in their winter habitats (Haug et al. 1993).

Habitat loss is considered to be a major factor limiting burrowing owl populations in the western United States (Yanishevsky and Petring-Rupp 1998). Declining populations of prairie dogs colonies, as a result of control programs and plague, have resulted in a reduction in suitable nest areas. Conversion of grasslands to intensive agriculture and urbanization has also had impacts on available burrow habitats. Other limiting factors include low recruitment of juveniles, predation, prey availability, parasites, weather shooting, vehicle collisions, and pesticides.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the western burrowing owl primarily involve recreational shooting of prairie dogs, habitat fragmentation, seismic exploration, and oil and gas development.

## Alternative A: No Action

#### Direct/Indirect Effects:

Under the No Action Alternative, no protective buffers would be provided for burrowing owls. Romin and Muck (2002) suggest a 0.25-mile buffer to avoid disturbance to owls during the nesting season. Drilling and construction activities may disturb nesting owls and lead to nest abandonment. Burrowing owls have demonstrated some level of tolerance to human activity in urban areas; however, no studies have investigated the impacts of oil and gas development. Seismic activities may lead to burrow collapse and abandonment or even loss of individuals. Increased habitat fragmentation may lead to a higher potential for vehicle collisions. Under Alternative A, a 0.125-mile (660 feet) NSO stipulation is applied for nest locations. This would impact approximately 31.4 acres for each active nest location.

Recreational shooting of prairie dogs could disturb owls during the nesting season. There is low potential for owls to be shot by recreation shooters of prairie dogs.

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

## Action Alternatives: Alternative B-D

## **Direct/Indirect Effects:**

The management of burrowing owls or their habitats does not change throughout Alternatives B, C, and D. For Alternative B, C, and D, a 0.25-mile NSO stipulation would be applied to surface-disturbing activities. Each active nest would receive a 125.6 acre buffer. This buffer is four times larger than the buffer in Alternative A. Seismic activities would continue at the same level and impact across all alternatives. Impacts from recreational shooting would be the same as in Alternative A.

#### **Cumulative Effects:**

Management of burrowing owls and their habitat is not expected to change throughout the planning area. No substantial development is expected to occur in known areas occupied by burrowing owls. These areas are associated with Gunnison prairie dog colonies. Prairie dog populations are expected to continually cycle and experience periodic plague outbreaks. Burrows would collapse due to lack of maintenance by active prairie dogs. Recreational shooting of prairie dogs is expected to continue across all alternatives

Oil and gas activity is expected to continue at the same levels as identified in the reasonable foreseeable development scenario. Disturbance to burrowing owl habitat would be limited to existing leases in the no new lease scenario.

#### Western Yellow-billed Cuckoo

## Natural History and Background

The western yellow-billed cuckoo was designated federal candidate species in October 2001. This species is rare to uncommon spring and fall migrant and summer resident throughout much of the Rocky Mountain region. Numbers of this species fluctuate widely from year to year. North American populations of this species are declining significantly and it is on the National Audubon Society Blue List. The range of the western subspecies of this bird has contracted, and populations have declined dramatically within the remaining range, due to loss of mature closed-canopy riparian forests with dense, thick, understories. It appears that this species was never common in the Rocky Mountains. There have been no recent breeding records in southwest Colorado (Carter 1998c). Suitable habitat on the TRFO is unknown but may occur in limited amounts. There is no recorded occurrence on the TRFO. Due to elevation and geographic location, and lack of suitable habitat quality, occurrence of this species would be considered rare and incidental.

Loss, degradation, and fragmentation of riparian habitat, drought, and prey scarcity (linked at least in part to pesticide use) may play a role in declines even where suitable habitat remains (Ehrlich et al. 1992).

Past management activities probably had little impact on habitat for western yellow-billed cuckoo. Habitat for the species is limited in the planning area.

### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the western yellow-billed cuckoo primarily involve livestock grazing and wildlife management activities (e.g., watershed, riparian, and aquatic habitat improvements).

#### Alternative A: No Action

#### Direct/Indirect Effects:

No direct or indirect effects on the yellow billed cuckoo are expected from the No Action Alternative because occurrence of the species is considered incidental to rare on the TRFO. Suitable habitat for this species on BLM and NFS lands is limited, with no breeding or local populations confirmed on public lands within the planning area.

#### Action Alternatives: Alternative B–D

## Direct/Indirect Effects:

No direct or indirect effects on the yellow-billed cuckoo are expected from implementation of any of the action alternatives because occurrence of this species is considered incidental to rare on the TRFO. Suitable habitat on BLM and NFS lands is limited, with no breeding or local populations confirmed on public lands within the planning area.

#### **Cumulative Effects:**

No cumulative effects are expected because of lack of suitable nesting habitat.

#### White-faced Ibis

## Natural History and Background

The white-faced ibis (*Plegadis chihi*) is a long-legged wader that inhabits wetlands and marshes and feeds in agricultural fields and flooded hay meadows. This species nests in marshes across the western United States (Great Basin) and winters in large flocks in Mexico, western Louisiana, and eastern Texas (Ryder and Manry 1994). They are nomadic breeders in response to drought and rains, represented by their wide distribution within their breeding colonies.

There is no known breeding habitat on the TRFO. Occurrence on BLM-administered lands are considered incidental during migration. There is one record of nesting at the Narraquinnep state wildlife area, but this appears to have been a chance occurrence (Levad, personal communication).

In Colorado, nesting ibises favor islands of tall emergents, such as bulrushes and cattails, surrounded by water greater than 18 inches in depth. The white-faced ibis feeds in agricultural fields, flooded hay meadows and shallowly flooded wetlands of short, emergent plants (Ryder and Manry 1994). Wetland plant communities such as sedges, spikerushes, glassworts, saltgrass (*Distichlis spicata*), and greasewood (*Sarcobatus vermiculatus*) are often utilized. In Nevada, Colorado, Utah, Idaho, and Oregon, agricultural fields of alfalfa, barley and native hay meadows are important feeding sites.

The white-faced ibis feeds on aquatic and moist-soil invertebrates, crustaceans, and earthworms (Ryder and Manry 1994). Earthworms are considered their principal food source (Yanishevsky and Petring-Rupp 1998). Other prey includes larval insects, leeches, snails, crayfish, small fish, and frogs.

Water level fluctuations, both natural and human-caused, may be the main cause of habitat deterioration for the white-faced ibis. Loss of feeding and nesting habitat due to drought, wetlands destruction, water diversion, or competition over water rights can lead to drastic decreases in population size. In addition to drought, flooding of nest sites may also cause temporary or permanent abandonment of traditional colony sites and possible abandonment of young (Ryder and Manry 1994). In addition, other limiting factors include weather productivity, predation, pesticides, toxicants, brood parasitism, and fire.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the white-faced ibis primarily involve water management and wildlife management activities (e.g., watershed, riparian, and aquatic habitat improvements).

## Alternative A: No Action

#### Direct/Indirect Effects:

No direct or indirect effects on the white-faced ibis are expected from the No Action Alternative because occurrence of the species is considered incidental to rare. Individuals occur only during migration. Suitable habitat for this species on BLM lands is limited, with no breeding or local populations confirmed on BLM-administered lands within the planning area.

#### Action Alternatives: Alternative B–D

#### Direct/Indirect Effects:

No direct or indirect effects on the white-faced ibis are expected from implementation of any of the action alternatives because occurrence of this species is considered incidental to rare. Individuals occur only during migration. Suitable habitat for this species on BLM lands is limited, with no breeding or local populations confirmed on BLM-administered lands within the planning area.

#### Cumulative Effects:

No specific LRMP components have been developed for the white-faced ibis because it is considered incidental during migration on BLM-administered lands. LRMP components and regulations specific to the management of wetlands for other species are expected to alleviate any potential cumulative effects and contribute to favorable habitat conditions for any ibis that may happen on the TRFO.

## 2.3.3 Insects

## **Great Basin Silverspot Butterfly**

## Natural History and Background

The Great Basin Silverspot or nokomis fritillary butterfly is a large and distinct fritillary that inhabits spring seeps and is associated with marshes with flowing water. It lives in wet meadows and seeps or sloughs at lower elevations, found only where there is permanent moisture sufficient to sustain a healthy violet crop at elevations from 5,200 to 9,000 feet. The Nokomis fritillary has one flight from mid-July to late September. Males patrol for receptive females, who walk on the ground to lay single eggs near host plants. Unfed, first-stage caterpillars hibernate and in the spring they feed on the leaves of the host. They have one brood from late July to September (Arizona Game and Fish Department 2005).

The Nokomis fritillary butterfly is found in streamside meadows and open seepage areas with an abundance of violets in generally desert landscapes. Colonies are often isolated (NatureServe 2013). For the species *Speyeria nokomis* the caterpillar host plant is northern bog violet. The adults feed on flower nectar including that from thistles (Arizona Game and Fish Department 2005). Limiting factors for the species as a whole are mainly habitat loss, herbiciding, heavy grazing, and changes to hydrology (NatureServe 2013).

There are two records of species occurrence south of the planning area boundary on state and private lands. There are no records of this species on BLM-administered lands in the planning area. Habitat for this species on BLM lands may exist along the Dolores River and an isolated BLM parcel on the Mancos River. Habitat may exist on split estate lands in the planning area.

Past management activities that may influence the habitat for this species have not changed over the life of the LRMP. Management activities that may alter habitat include livestock grazing.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the nokomis fritillary butterfly primarily involve livestock grazing. Grazing during critical times of the year may remove host plants for the Great Basin silverspot caterpillars. Impacts to seeps and springs that support *Viola* spp., the host plant, could influence potential habitat for the Nokomis fritillary butterfly. Livestock grazing is a dominant land use practice in many of the areas that could potentially support the species. Light grazing is not expected to influence the habitat components or riparian features that support the host plant. However, livestock grazing can damage seeps and springs if grazing is heavy or trampling occurs.

#### Alternative A: No Action

#### Direct/Indirect Effects:

The Nokomis fritillary butterfly is not known to occur on BLM lands in the planning area. However, surveys are limited and the species could potentially occur around seeps and springs in low-elevation habitat types. The current plan identified 64,200 AUMs available on BLM-administered lands in the planning area. Permitted livestock grazing in alternative A is 36% of available AUMs.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Total AUMs available does not vary across any alternative, at 64,200. Permitted AUMs vary slightly across all alternatives. Alternative B provides the same amount of livestock grazing as Alternative A at 36% of available AUMs being permitted. There is a slight reduction in AUMs in Alternative C where 22% of available AUMs being authorized for grazing, and a slight increase in Alternative D with 40% being permitted. Conservation measures do not change across Alternatives B, C, and D that would protect seeps and springs.

#### **Cumulative Effects:**

Cumulative effects are similar across all alternatives. Since the signing of the current LRMP, permitted livestock grazing has been reduced by 64% of available AUMs. Drought and other factors influence permitted AUMs. Management activities would continue to monitor rangeland health, which includes monitoring of riparian areas. Habitat is expected to continue maintain or improve across all alternatives in as much as management has the potential to influence the habitat for this species. Droughts may continue and would influence habitat and distribution of this species.

## 2.3.4 Amphibians

#### **Boreal Toad**

## Natural History and Background

The boreal toad, also known as the mountain or western toad (Hammerson 1999), is Colorado's only alpine species of toad.

*Bufo boreas boreas* is one of two subspecies of the western toad found in the United States (USFWS 2002). While some historic populations have existed on the SJNF, there are currently no known populations. Surveys for presences are conducted annually. The boreal toad (Southern Rocky Mountain population) primarily generally occurs between 8,000 and 11,000 feet elevation in spruce-fir forests and subalpine and alpine meadows. They have been reported as high as 11,860 feet in the San Juan Mountains.

The boreal toad typically inhabits areas with damp conditions in the vicinity of marshes, wet meadows, streams, beaver ponds, glacial kettle ponds and lakes interspersed in subalpine forests. In Colorado, the largest populations are typically found in areas characterized by willows, bog birch, and shrubby cinquefoil (USFWS 1994). In southern Colorado they have been reported in areas where ponderosa pine is present.

During the early spring and summer boreal toads are usually found in water, at the water's edge, or on top of partially submerged logs. Later in the summer toads have been reported to disperse a considerable distance (up to 2.5 miles) from breeding areas to upland forest sites (Loeffler 2001). They still tend to favor moist sites. However, some toads, especially females may relocate to drier montane habitats offering dense vegetation for cover.

Habitat for the boreal toad is found on NFS lands of all districts on SJNF, primarily within the spruce-fir and alpine zones. Because suitable elevations have been reported to as low as 8,000 feet, cool, moist mixed conifer forests and aspen with appropriate site characteristics may also provide additional suitable habitat. Ponds, wet meadows, wet stands of willow, small lakes, marshes, beaver impoundments, and glacial kettle ponds would offer suitable breeding habitat for this species. Suitable late summer non-breeding habitat would be found within 2.5 miles of suitable breeding areas (Loeffler 2001).

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the boreal toad primarily involve livestock grazing (sheep only), road construction/reconstruction, and motorized/non-motorized recreation.

The primary direct effect of roads on boreal toads involves the crushing of individuals from vehicle use. Roads can also create barriers to water flow and to the movement of toads across the landscape. The indirect effects of roads on landscape hydrology can influence wetlands and riparian vegetation (Loeffler et al. 2001). Roads within riparian zones can also lead to conflicts with beaver, which if removed can disrupt key habitat processes related to beaver ponds (Loeffler et al. 2001). Alternative A offers more high-use recreation areas than any of the action alternatives, including areas suitable for motorized recreation. This difference could potentially allow greater impacts to high-elevation upland sites that could be considered potential habitat. Because all historic breeding sites are now absent of toads, no impacts are expected from the small amount of roads to be constructed/reconstructed in Alternative A.

Primary influences from recreational activities can include direct trampling (eggs and toadlets). Many indirect effects can also occur that influence riparian vegetation and water quality. Potential activities that could influence boreal toad populations and/or habitat include off-road vehicle use, trail construction and use, camping in riparian areas, and activities related to fisheries management such as in-stream channel work, poisoning, and stocking of fish in areas that historically did not support them (Loeffler et al. 2001). Alternative A offers more high-use recreation areas than any of the action alternatives, including areas suitable for motorized recreation. This difference could potentially allow greater impacts to high-elevation upland sites that could be considered potential habitat.

Livestock grazing is not considered much of threat to boreal toads even when the activity overlaps species occurrence (Loeffler et al. 2001). Cattle generally do not overlap with most boreal toad sites because their grazing occurs primarily at lower-elevations. However, domestic sheep are grazed at higher elevations and can frequently overlap with potential boreal toad habitat. Potential direct effects from grazing can include trampling. Potential indirect effects can include reduced egg and tadpole survival from changes in water chemistry and/or riparian vegetation related to grazing. Overall grazing influences can lead to changes in riparian vegetation and hydrology (Loeffler et al. 2001).

#### Alternative A: No Action

#### Direct/Indirect Effects:

Recreation use and impacts in boreal toad habitat across the TRFO does not vary across alternatives. Travel is limited to existing roads and trails. No new roads are anticipated in boreal toad habitat due to the wetland characteristics of the habitat.

Alternative A and all action alternatives continue to allocate allotments to domestic sheep grazing. Alternative A maintains the same permitted numbers and area as Alternative B, currently set at 2,073 AUMs.

## Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

As noted in Alternative A, impacts from recreation and roads does not vary across alternatives. Grazing levels are the same in Alternative B. Alternative C authorizes 16 AUMs, which would essentially remove domestic sheep grazing in boreal toad habitat. Alternative D would authorize 2,281 AUMs, 208 AUMs more that Alternatives A and B.

Permitted grazing across the planning area is substantially reduced from available AUMs. Alternatives A and B authorize cattle and sheep grazing at 36% of available AUMs. Alternative C authorizes cattle and sheep grazing at 22% of available AUMs and Alternative D authorizes grazing at 40% of available AUMs.

#### Cumulative Effects:

The boreal toad has significantly declined through portions of its range in Colorado, Utah, and Wyoming. These declines are not thought to be strongly associated with habitat conditions, but rather to a larger issue that may be an early indicator of other types of environmental degradation at a global scale (Jones 2003). For example, the recent discovery of chytrid fungus in some boreal toad populations in Colorado may be contributing to their decline. Samples taken from 43 sites in Colorado during 2000 to 2001 indicated that approximately 9% of 213 boreal toads tested chytrid positive (Livo 2002). This fungus has now been identified in boreal toads from over a dozen Colorado populations and evidence suggests that this pathogen was responsible for the declines documented in the late 1970s and early 1980s.

Interagency efforts are currently underway to learn more about chytrid fungus and halt its spread. A captive-breeding program has also been established that can be used to reintroduce boreal toads back into suitable former habitat areas. The habitat condition on the TRFO remains in excellent condition to reintroduce the species as appropriate. The state recovery plan and the interagency conservation plan and agreement are both expected to minimize any potential cumulative effects on the boreal toad.

Domestic sheep grazing is expected to continue at moderate levels. Recreation is expected to continue within boreal toad habitat. All boreal toad habitats on BLM-administered lands are located in the Silverton area. Silverton receives approximately 300,000 visitor use days annually.

## **Canyon Tree Frog**

## Natural History and Background

The canyon tree frog occurs in western Colorado along the southern edge of the Colorado River valley, east to Grand Junction and along the Dolores River and its tributaries from near the Utah border, and south to San Miguel County (Hammerson 1999). Colorado is on the fringe of the species territory that extends into southern Utah, western New Mexico, southwest Texas, eastern Arizona, and northern Mexico. The frog is small growing up to 2.2 inches. It is gray, tan, or olive in color typically with green or gray blotches or spots, although sometimes lacking (International Union for Conservation of Nature and NatureServe, 2004, range data developed as part of the Global Amphibian Assessment and provided by International Union for Conservation of Nature World Conservation Union, Conservation International, and NatureServe).

The canyon tree frog is found in western Colorado at elevations of about 4,500 to 6,300 feet. The canyon tree frog occurs mainly in intermittent or permanent streams and pools in deep rocky canyons. Sparse cottonwood galleries often grow along inhabited stream courses. Except on warm rainy nights, canyon tree frogs do not range far from the permanent canyon—bottom pools (Hammerson 1999). During the cold season or periods of drought, frogs retreat to rock crevices not far from their breeding sites. Most activity takes place at night from May to September. These frogs often perch in the sun on dry steeply sloped rocks and rock crevasses. At dusk they climb down from their day perches and move toward water to breed or forage (Brennan 2010).

The canyon tree frog breeding seems to peak between May and June, but may take place as late as July if spring conditions are exceptionally dry (Hammerson 1999). Tadpoles may grow to 1.5 inches prior to metamorphosis. Tadpoles typically have dark spots and patches, and become speckled with golden or bronze coloration as they mature. Tadpoles feed mainly on minute organic materials, which include bottom detritus and plant material. Adults feed mainly on small invertebrates such as caterpillars, beetles, ants, and caddisflies.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the canyon tree frog primarily involve livestock grazing, motorized and non-motorized recreation, water management, oil and gas development, and wildlife management activities (e.g., watershed, riparian, and aquatic habitat improvements).

#### Alternative A: No Action

#### Direct/Indirect Effects:

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. Though there is no literature that specifically points out impacts of oil and gas development to this species, the slight increase in available leased lands could negatively impact the canyon tree frog over time.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives. Mastication and prescribed fire would have minimal impacts to the canyon tree frog due to its specific habitat requirements that would not likely be treated by these management actions.

In general, Alternative A offers similar management to what is currently in place, which has not likely had negative affects to the canyon tree frog. The effect of livestock grazing on riparian areas, water quality, and upland habitats is well documented (Belskey and Uselmann 1999; Buckhouse and Gifford 1976; Kauffman and Krueger 1984; Krueper 1992). These effects include sedimentation, degradation of water quality, direct trampling, and changes in vegetation and/or moisture retention capacity and may affect breeding habitat, migration habitat, and/or over-wintering habitat (Smith 2003). Because the canyon tree frog occurs primarily at lower elevations, its range would primarily overlap areas used for cattle grazing.

Alternative A continues the current range management practices under the current management plans for both the USFS and BLM. Cattle grazing in riparian zones in the planning area have the potential to have negative influences on potential habitat for the canyon tree frog. The LRMP revision components developed for amphibians and other riparian associated species are intended to minimize impacts to riparian areas. Although improvements continue to be made, there is a potential that impacts to individual habitats and/or frogs could occur in some areas.

Alternative A offers more high-use recreation areas than any of the action alternatives, including areas suitable for motorized recreation. This difference could potentially allow greater impacts to riparian areas that offer potential habitat for the canyon tree frog.

Riparian and watershed improvements may benefit potential habitat for the canyon tree frog if the activity occurs in or near occupied or potential habitat. Examples of this activity could include fencing or correcting erosion problems that have occurred from past activities. The outputs for this activity are similar across all alternatives.

### Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of sensitive species, and in particular riparian areas, do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alternative C designating more lands for natural or unique landscapes or processes. Under Alternative C more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower. Development in canyon tree frog habitat under any of the action alternatives would be minimal due to its strict habitat requirements that are limited to rocky riparian areas. However, if development were to occur in canyon tree frog habitat, it could have an overall negative impact to this species. Site-specific analysis of potential impacts would be analyzed and mitigated at the project level.

Alternatives B, C and D offer fewer potential impacts from oil and gas development identified in Alternative A, because they offer fewer acres of potential lease area. Though there is no literature that specifically points out impacts of oil and gas development to this species, the slight increase in available leased lands could negatively impact the canyon tree frog over time.

The fewer amounts of available lease acres and greater amount of protective lease stipulations suggest that fewer potential impacts to riparian habitats, amphibians, and other associated species may be associated with the action alternatives. Still, some potential impacts may still occur and influence habitat components or impact individual tree frogs. Under the "no new lease" scenario, only the existing lease areas have potential for development under these alternatives resulting in fewer acres of potential influence to the species.

Alternative B maintains the same permitted numbers and area for domestic livestock grazing as Alternative A. No difference in risk or protective measures for the tree frog is expected under this alternative. Alternative C reduces livestock numbers and allotment area and has the potential to reduce potential impacts to canyon tree frogs if the differences involves occupied or potential habitat. Alternative

D allows more livestock grazing than any other alternative and increases livestock numbers and allotment areas. Alternative D may therefore require more management attention to assure that domestic livestock are not impacting riparian habitat attributes that are important to the canyon tree frog and other associated species.

All action alternatives offer fewer potential disturbances than the No Action Alternative from summer motorized recreation because of decrease in the amount of permitted motorized use area. Consistent with their themes, Alternative C offers the fewest motorized acres while Alternative D offers the highest amount of acreage. Alternative B offers a balance between the two other action alternatives, but also provides less potential disturbance than Alternative A. Potential benefits to the northern leopard frog are expected to be associated with Alternatives B and C, with perhaps a higher risk of impact in Alternative D.

Riparian and watershed improvements may benefit potential habitat for the canyon tree frog if the activity occurs in or near occupied or potential habitat. Examples of this activity could include fencing or correcting erosion problems that have occurred from past activities. The outputs for this activity are similar across all alternatives.

#### Cumulative Effects:

Management actions associated with any of the alternatives are not likely to greatly impact this species over the life of the LRMP. Grazing may continue to occur in the specific habitat required by this species. Impacts from grazing in riparian areas are monitored and any long-term impact to potential canyon tree frog habitat would be mitigated through grazing management.

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation and the disturbance from oil and gas development on canyon tree frogs are not well known other than the direct loss of suitable habitat. Alternatives A through D include both current and projected new leases; the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

The specific components and conservation measures included in the LRMP revision that have been developed for sensitive species are expected to adequately alleviate any potential cumulative effects and protect most of the habitat elements required by the canyon tree frog. Special management attention may be warranted in areas that are known to have existing and high-potential breeding habitat.

## **Northern Leopard Frog**

## Natural History and Background

The northern leopard frog is a medium-sized frog with an adult body length that typically ranges from 2 to 3.5 inches with a maximum of 4.3 inches (Hammerson 1999).

Within Colorado the northern leopard frog occurs throughout much of the state, although most occurrences are in the western half of the state including the Front Range. On the eastern plains it occurs in more spotty distribution with populations associated primarily with major drainages systems (Hammerson 1999).

The habitats used by the northern leopard frog are varied across its range. In Colorado it is reported to range in occurrence from below 3,500 feet in northeast Colorado to above 11,000 feet in southern Colorado (Hammerson 1999). Merrell and Rodell (1968) describe three major habitat divisions: winter habitat (lakes, streams and ponds), summer habitat (post-breeding areas including upland habitats for feeding), and egg/tadpole habitat (shallow breeding ponds). Although aqueous habitats are a central feature in the frog's cycles of life, it may range a considerable distance from natal and breeding areas to a variety of other habitat types. Typical aqueous features used by the northern leopard frog include wet meadows and the banks and shallows of marshes, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches (Hammerson 1999). Streams are often used as dispersal corridors, but upland areas are also used.

Suitable breeding habitat for the northern leopard frog on BLM-administered lands would be found in streams, natural lakes and ponds, glacial kettles, stock ponds and reservoirs, marshes, and wetlands. Post-breeding habitat would be found along the edges of these features, as well as the surrounding upland habitats (generally within 2 miles). Wintering habitat would be found in streams, ponds, and lakes that do not completely freeze during winter and do not have substantial populations of predaceous fish.

Larvae of the northern leopard frog are primarily vegetarian gaining sustenance by filtering free-floating algae from their surrounding waters. However, they have been observed feeding on dead animal material including conspecifics. Adults and sub-adults are carnivorous and primarily insectivorous, although they have been described as generalists that can consume anything that is small enough to swallow. Beetles and grasshoppers may make up a large portion of their diets. Other common prey includes flies, wasps and bees, and spiders. Studies on stomach contents have also found mollusks, crustaceans, garter snakes, hummingbirds, and a yellow warbler (Smith 2003).

Loss or degradation of breeding habitat can occur through changes in hydrology or water quality. Other factors include habitat fragmentation, predation, disease, sensitivity to ultraviolet radiation, and recruitment into the population.

#### Effects Common to All Alternatives

LRMP revision activities that could potentially influence the northern leopard frog primarily involve fluid minerals development, livestock grazing, motorized recreation, water management, and wildlife management activities (e.g., watershed, riparian, and aquatic habitat improvements).

Impacts from oil and gas development primarily involve the fragmentation of habitat that northern leopard frog may disperse into. Breeding habitat is protected through a variety of stipulations within the LRMP. Riparian areas are protected from disturbance under leasing stipulations.

The effect of livestock grazing on riparian areas, water quality, and upland habitats is well documented (Belskey and Uselmann 1999; Buckhouse and Gifford 1976; Kauffman and Krueger 1984; Krueper 1992). These effects include sedimentation, degradation of water quality, direct trampling, and changes in vegetation and/or moisture retention capacity and may affect breeding habitat, migration habitat, and/or over-wintering habitat for northern leopard frogs (Smith 2003). Because the leopard frog occurs primarily at lower elevations, its range would primarily overlap areas used for cattle grazing.

Road-related mortality of juvenile northern leopard frogs is well documented (numerous authors in Smith 2003). Significant road mortality of emergent adults migrating to their breeding ponds has also been noted (Nussbaum et al. 1983). Roads may also be associated with factors such as sedimentation and the runoff of toxic compounds that can also affect aquatic communities (Trombulak and Frissell 2000; Welsh and Oliver 1998). Alternative A offers more high-use recreation areas than any of the action alternatives, including areas suitable for motorized recreation. This difference could potentially allow greater impacts to riparian areas that offer potential habitat for the northern leopard frog.

#### Alternative A: No Action

#### Direct/Indirect Effects:

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Alternative A and all action alternatives continue to allocate allotments to domestic grazing. Alternative A permits fewer AUMs that Alternatives B and D and more than Alternative C.

#### Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

The fewer amounts of available lease acres and greater amount of protective lease stipulations suggest that fewer potential impacts to riparian habitats, amphibians, and other associated species may be associated with the action alternatives. Still, some potential impacts may still occur and influence habitat components or impact individual leopard frogs. Under the "no new lease" scenario only the existing lease areas have potential for development under these alternatives, resulting in fewer acres of potential influence to the species.

Permitted grazing across the planning area is substantially reduced from available AUMs. Alternatives A and B authorize cattle and sheep grazing at 36% of available AUMs. Alternative C authorizes cattle and sheep grazing at 22% of available AUMs, and Alternative D authorizes grazing at 40% of available AUMs

All action alternatives offer fewer potential disturbances than the No Action Alternative from summer motorized recreation because of decrease in the amount of permitted motorized use area. Consistent with their themes, Alternative C offers the fewest motorized acres while Alternative D offers the highest amount of acreage. Alternative B offers a balance between the two other action alternatives, but also provides less potential disturbance than Alternative A. Potential benefits to the northern leopard frog are expected to be associated with Alternatives B and C, with perhaps a higher risk of impact in Alternative D.

#### **Cumulative Effects:**

The northern leopard frog has significantly declined throughout most portions of its range, with populations in the western United States apparently declining at a quicker rate than those in the east (Smith 2003). The northern leopard frog has also experienced significant declines in Colorado (Hammerson 1999). Introduced predators and habitat have been indicated as causes in some areas. However, as with all amphibians, the causes are complex and may involve several factors. Currently, it is believed that anthropogenic stressors may be related to the declines and causing some amphibian species to be more susceptible to infectious diseases (Carey et al. 1999; Smith 2003).

The conservation measures included in the LRMP revision are expected to be adequate for protecting most of the habitat elements required by the northern leopard frog. Given the decline in their populations, however, special management attention has been identified in the LRMP in areas that still retain existing and high-potential breeding habitat.

## 2.3.5 Reptiles

### **Desert Spiny Lizard**

## Natural History and Background

The desert spiny lizard (*Sceloporus magister*) is one of two BLM sensitive reptile species that may occur in the planning area. The desert spiny lizard has only been documented in the extreme southwest part of Colorado, but it could occur within the TRFO based on its habitat attributes, which include shrub-covered dirt banks and sparsely vegetated rocky areas near flowing streams or arroyos. They also prefer soft soils beneath greasewood, rabbitbrush, saltcedar (*Tamarix* sp.), and other shrubs and also frequently perch on large rocks or in large shrubs or trees (Hammerson 1999).

The primary period of activity for the desert spiny lizard is from May to September with some activity in April and October during warm weather (Hammerson 1999). Courtship takes place in May and hatchlings first appear in early August. Adults stay within a small home range (1.6–6 acres) from year to year and adult males are extremely territorial to other individuals (Hammerson 1999). The adults relatively small home range does not change much from year to year, where juvenile desert spiny lizards may move several hundred meters before establishing a territory of their own (Tanner and Krogh 1973). Desert spiny lizards feed opportunistically on available arthropods, occasional small lizards and some plant material. According to Hammerson, Johnson (1966) found that ants and beetles are major food items for the desert spiny lizard in Montezuma County. This species is dormant during the winter and would not likely be affected by management activities that are limited to the surface during the winter months.

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the desert spiny lizard primarily involve fuels treatments, oil and gas development, and motorized recreation. Because this species is known to inhabit the same territory from year to year, management activities within these territories could displace individuals and disrupt critical life functions.

Livestock grazing impacts to wildlife under all alternatives may include loss of forage and/or impacts to riparian habitats favored by many species of wildlife. Livestock grazing may lead to conversion of native vegetation to invasive weeds, such as cheatgrass. This may have the potential to impact special status species, especially the desert spiny lizard.

The expansion of motorized transportation and the use of roads from motorized recreationists could impact this species. Roads can result in direct habitat loss and habitat fragmentation, can encourage the spread of noxious weeds, is a source of disturbance, interfere with movement patterns, and can cause direct mortality. There are two measures of transportation that can be evaluated: 1) road length and its associated area of ground disturbance and 2) road density involving the number of miles of roads per square mile. Although there are numerous variables to consider when determining impacts, the comparison of road length and density under the different alternatives may be used as a comparison for this potential impact.

Because this species is not thought to have a wide-spread distribution in the TRFO, the proposed alternatives and the actions associated with these alternatives would have minimal impact to this species.

## Alternative A: No Action

#### Direct/Indirect Effects:

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area. Though there is no literature that specifically points out impacts of oil and gas development to this species, the slight increase in available leased lands could negatively impact the desert spiny lizard over time.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives and vary by only 100 to 200 acres. As with mastication, prescribed fire could have a negative impact to desert spiny lizards in that it could reduce forage and displace individuals.

In general, Alternative A offers similar management to what is currently in place, which has not likely had negative effects to the desert spiny lizard.

#### Action Alternatives: Alternative B-D

#### Direct/Indirect Effects:

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of sensitive species do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alternative C designating more lands for natural or unique landscapes or processes. Under Alternative C, more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower. Increased development in desert spiny lizard habitat under any of the action alternatives could have an overall negative impact to this species. Site-specific analysis of potential impacts would be analyzed and mitigated at the project level.

#### **Cumulative Effects:**

Oil and gas development would continue throughout known formations and foraging habitat would continue to be fragmented. The extent or the impacts of fragmentation and the disturbance from oil and gas development on desert spiny lizards are not well known other than the direct loss of suitable habitat. Alternatives A through D include both current and projected new leases; the "no new lease" scenario only includes current leases under each of the alternatives. Under the No Leasing Alternative development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

The specific LRMP components that have been developed for sensitive species and existing regulations are expected to alleviate any potential cumulative effects and contribute to favorable habitat conditions for any individual desert spiny lizard that occurs within the TRFO.

## **Longnose Leopard Lizard**

## Natural History and Background

The long-nosed leopard lizard (*Gambelia wislizenii*) is a larger-bodied lizard that is one of two BLM reptiles on the sensitive species list. Habitat for the long-nosed leopard lizard is flat or gently sloping shrublands with a large percentage of open ground and includes mesa tops above canyons. Specific habitat for this lizard includes lowland desert and semi-desert areas with scattered shrubs or other low plants, such as sagebrush, especially in areas with abundant rodent burrows (Hammerson 1999). Hammerson (1999) describes other habitat associations in southwest Colorado, including areas along the Dolores River where leopard lizards inhabit areas with sandy-rocky soils and scattered sagebrush, junipers, and skunk brush in canyon bottoms. The leopard lizard's distribution in Colorado is not well known, and the species could exist in lower elevations in the western part of the planning area.

Like the desert spiny lizard, the long-nosed leopard lizard has a small home range from 1.6 to 6 acres in size (Hammerson 1999). It is slightly more limited in its activity period (from May to early August) and they have an unwary behavior, which makes them vulnerable to human exploitation (Hammerson 1999). Adults in Colorado are active through June and July, then disappear underground by early August. Hatchlings may remain active through early September.

The known diet in Colorado includes grasshoppers, beetles, spiders, wasps, ant lions caterpillars, and a variety of smaller lizards (Hammerson 1999). This lizard is an active diurnal predator that, while omnivorous, is known for being able to eat lizards its own size, including members of its own species (Jones 2009).

## Effects Common to All Alternatives

LRMP revision activities that could potentially influence the long-nosed leopard lizard primarily involve fuels and treatments, oil and gas development, and motorized recreation. Because this species is known to inhabit the same territory from year to year, management activities within these territories could displace individuals and disrupt critical life functions.

Livestock grazing impacts to wildlife under all alternatives may include loss of forage and/or impacts to riparian habitats favored by many species of wildlife. Livestock grazing may lead to conversion of native vegetation to invasive weeds, such as cheatgrass. Because the long-nosed leopard lizard are most common where the ground surface between shrubs is bare or sparsely vegetated, cheatgrass infestation could alter the habitat in a way that is unusable to this lizard. Moderate livestock grazing could be beneficial to this species. Removal of grazing from its habitat could render the habitat unusable to longnose leopard lizards.

The expansion of motorized transportation and the use of roads from motorized recreationists could impact this species. Roads can result in direct habitat loss and habitat fragmentation, can encourage the spread of noxious weeds, is a source of disturbance, interfere with movement patterns, and can cause direct mortality. There are two measures of transportation that can be evaluated: 1) road length and its associated area of ground disturbance and 2) road density involving the number of miles of roads per

square mile. Although there are numerous variables to consider when determining impacts, the comparison of road length and density under the different alternatives may be used as a comparison for this potential impact.

Because this species is not thought to have a widespread distribution in the planning area, the proposed alternatives and the actions associated with these alternatives would have minimal impact to this species.

#### Alternative A: No Action

#### Direct/Indirect Effects:

Acres of federal minerals available for leasing are fairly similar across Alternatives A, B, and C. Alternatives A, B, and D open the largest percentages of federal minerals to leasing with 92%, 92%, and 93% of federal minerals available for leasing, respectively. Alternative C opens the fewest acres to leasing with 74% federal minerals available for leasing. No acres are available for leasing under the No Leasing Alternative.

Under Alternative A, 13% of leased acres would have NSO stipulations, whereas Alternatives B, C, and D would have 29%, 35%, and 18% of leased acres with NSO stipulations, respectively. Under the No Leasing Alternative development would be limited to existing leases within the planning area.

Alternative A offers similar fuels treatments throughout all alternatives. Acres of fuels treatments vary by no more that 6% across all alternatives. Prescribed fire activity projections are also similar across all alternatives, and vary by only 100 to 200 acres. As with mastication, prescribed fire could have an overall negative impact to long-nosed leopard lizards in that a decrease in cover in suitable habitat could occur.

Alternative A provides the same wildlife management actions in regards recreational impacts in longnosed leopard lizard habitat.

In general, Alternative A offers similar management to what is currently in place and has allowed these populations to be successful.

#### Action Alternatives: Alternative B-D

#### <u>Direct/Indirect Effects:</u>

Effects from Alternatives B, C, and D are similar to the impacts in Alternative A. Standards and guidelines that protect the habitats of the sensitive species do not vary throughout alternatives. Acres allocated for development may be altered by alternative with Alternative C designating more lands for natural or unique landscapes or processes. Under Alternative C, more habitats would be managed for less development and habitat fragmentation across the planning area may be slightly lower. Increased development in long-nose leopard lizard habitat under any of the action alternatives could have an overall negative impact to this species. Site-specific analysis of potential impacts would be analyzed and mitigated at the project level.

#### Cumulative Effects:

Oil and gas development would continue throughout known formations and lizard habitat could continue to be fragmented. The extent or the impacts of fragmentation and the disturbance from oil and gas development on long-nosed leopard lizards are not well known other than the direct loss of suitable habitat. Alternatives A through D include both current and projected new leases; the "no new lease" scenario only includes current leases under each of the Alternatives. Under the No Leasing Alternative, development would most likely slow to lower than historic rates due to the lack of available leases for exploration and development. Development levels are identified in the RFD scenario.

The specific LRMP components that have been developed for sensitive species and existing regulations are expected to alleviate any potential cumulative effects and contribute to favorable habitat conditions for any individual long-nosed leopard lizard that occurs within the planning area.

# 3 U.S. FOREST SERVICE SENSITIVE PLANTS BIOLOGICAL EVALUATION

# 3.1 Sensitive Species Considered and Evaluated

Table T.13 lists the sensitive plant species evaluated by the USFS for the SJNF portion of the planning area.

Table T.13: U.S. Forest Service Sensitive Plants Evaluated for the San Juan National Forest

Sensitive Plant Species	Habitat Association or Vegetation Type
Stonecrop gilia	
Aliciella sedifolia	Alpine (dry, rocky, gravelly talus of tuffaceous sandstone)
Missouri milkvetch	Pinyon-juniper woodlands, ponderosa pine forests, Gambel oak
Astragalus missouriensis var. humistratus	shrublands (underlain by Mancos Shale)
Aztec milkvetch	Ponderosa pine, pinyon-juniper, mountain shrubland
Astragalus proximus	Fonderosa pine, pinyon-jumper, mountam sinuotand
Lesser panicled sedge	Riparian/wetland (fens)
Carex diandra	
Lesser yellow lady's slipper orchid	Aspen, ponderosa pine (restricted to calcareous derived soils in
Cypripedium parviflorum	montane aspen and ponderosa pine forest)
Smith's draba	Mixed conifer (montane seeps, rock cracks and crevices in shaded
Draba smithii	protected sites)
English sundew	Riparian/wetland (fens)
Drosera anglica	Riparian/ wetiand (16115)
Stream orchid	Riparian/wetland (seeps on sandstone cliffs and hillsides)
Epipactis gigantea	Repartan/ wettand (seeps on sandstone entris and ministees)
Whitebristle cottongrass	Riparian/wetland (fens)
Eriophorum altaicum var. neogaeum	Ripurium wettand (16115)
Chamisso's cottongrass	Riparian/wetland (fens)
Eriophorum chamissonis	Ripurium wettand (16115)
Slender cottongrass	Riparian/wetland (fens, wet meadows)
Eriophorum gracile	
Lone Mesa snakeweed	Pinyon-juniper, semi-desert shrubland, sagebrush (barren Mancos
Gutierrezia elegans	Shale outcrops)
Frosty bladderpod	Mountain grasslands and mountain shrublands (soils derived from
Lesquerella pruinosa	Mancos Shale)
Colorado tansyaster	Alpine, spruce-fir (gravelly areas on slopes and in parks, on soils of
Machaeranthera coloradoensis	sedimentary or volcanic origin)
Kotzebue's grass-of-Parnassus	Sub-alpine and alpine (wet areas along streamlets and in moss mats)
Parnassia kotzebuei	
Cushion bladderpod	Pinyon-juniper, semi-desert shrubland, sagebrush (barren shale
Physaria pulvinata	outcrops)
West silver bladderpod	Alpine (barren exposure of Leadville limestone)
Physaria scrotiformis	
Arizona willow	Riparian/wetland (high elevation wet meadows, stream sides, and
Salix arizonica	cienegas)
Sageleaf willow	Riparian/wetland (fens)
Salix candida	, ,
Autumn willow	Riparian/wetland (fens and possibly stream banks)
Salix serissima	
Sphagnum moss	Riparian/wetland (fens)
Sphagnum angustifolium	

Sensitive Plant Species	Habitat Association or Vegetation Type
Baltic bog moss	Riparian/wetland (fens)
Sphagnum balticum	
Largeflower triteleia	D 1
Triteleia grandiflora	Ponderosa pine
Lesser bladderwort	Aquatic (submerged in shallow water, inundated mudflats, or areas
Utricularia minor	with emergent vegetation)

# 3.2 Sensitive Species Evaluations

## 3.2.1 Stonecrop Gilia (Aliciella sedifolia)

Stonecrop gilia (referred to in some sources as *Gilia sedifolia*) is a member of the phlox family. It appears to be biennial or possibly a short-lived monocarpic perennial (Anderson 2004). It is an extremely rare, narrow endemic species whose entire know global distribution is confined to two occurrences in the San Juan Mountains of southwest Colorado at approximately 11,800 to 13,400 feet in elevation. Both known occurrences are on lands managed by the USFS. The Sheep Mountain occurrence (thought to be on the SJNF) was last seen in 1892. The Half Peak occurrence (on the Gunnison National Forest) consists of two stands and approximately 1,100 individuals and was last seen in 2003. This species is apparently restricted to dry, rocky, or gravelly talus of tuffaceous sandstone. Alpine areas on ash-flow tuff parent material may also be suitable habitat. The population found in 2003 was found in large bare gravel patches that contained no other plants except some lichens and a few very scattered other species (Anderson 2004; Komarek 2003). Stonecrop gilia is ranked globally critically imperiled (G1) by NatureServe, and it is considered critically imperiled (S1) in Colorado. The activity that may occur on the SJNF with the most potential to impact stonecrop gilia is recreation.

## 3.2.2 Missouri Milkvetch (Astragalus missouriensis var. humistratus)

Missouri milkvetch is a low-growing perennial in the pea family. It has greenish gray foliage with noticeable aboveground prostrate stems and pinkish purple flowers with white-tipped petals. The reduced stature, apparent unpalatability and long lifespan of Missouri milkvetch indicates that it is a stress tolerator, which is a trait shared by many other Astragalus species. Missouri milkvetch is a local endemic species whose global distribution is limited to three known locations in northwest New Mexico and 12 in southwest Colorado. There are four known locations on the SJNF on the Pagosa and Columbine Ranger Districts (Decker 2006a). Occurrences of this species in Colorado are associated with pinyon-juniper woodlands, ponderosa pine forests, and Gambel oak mountain shrublands. Within these types, it is typically found in openings or on sparsely vegetated soils at elevations ranging from about 7,100 to 8,600 feet. Missouri milkvetch appears to favor shaley substrates, as the majority of known populations are on sites underlain by Mancos Shale or Lewis Shale, with a few on shales of the Mesa Verde Formation (Decker 2006a). The species is ranked as a critically imperiled variety of an otherwise widespread and common species (G5T1) by NatureServe. It is considered critically imperiled (S1) in Colorado. Activities that may occur on the SJNF with the most potential to impact Missouri milkvetch include livestock grazing, solid mineral development, oil and gas development, fire management, timber harvest, and mechanical fuel treatment.

# 3.2.3 Aztec Milkvetch (Astragalus proximus)

Aztec milkvetch is a perennial in the pea family, with slender pale green-gray stems growing from 6 to 20 inches tall. When flowering, it typically holds 12 to 40 flowers with white or lavender-tinged petals. The reduced stature, apparent unpalatability, and long lifespan of Aztec milkvetch indicate that it is a stress tolerator, which is a trait shared by many other *Astragalus* species and is common among species of sparsely vegetated habitats (Decker 2005). Aztec milkvetch is a local endemic species whose global distribution is limited to the San Juan Basin in southwest Colorado and northwest New Mexico. It is fairly common within the New Mexico part of the basin, but is much rarer in the Colorado portion of its range. Documented locations include five sites on the Pagosa and Columbine Ranger Districts of the SJNF ranging from 6,650 to 7,350 feet in elevation. Aztec milkvetch occurrences in Colorado are associated

with pinyon-juniper woodlands (with or without sagebrush) and ponderosa pine/Gambel oak forests. Soils are sandy or clayey and contain shale rock fragments. Aztec milkvetch is ranked globally apparently secure (G4) by NatureServe and imperiled (S2) in Colorado. Activities that may occur on the SJNF with the most potential to impact Aztec milkvetch include livestock grazing, recreation, solid mineral development, oil and gas development, fire management, timber harvest, and mechanical fuel treatment.

## 3.2.4 Lesser Panicled Sedge (Carex diandra)

Lesser panicled sedge is a perennial, tussock forming species in the sedge family widely distributed globally. It is found throughout Europe and Asia, the Canary Islands, and New Zealand. In North America, it is found in all Canadian provinces and is discontinuously distributed in 30 U.S. states. It is documented from 14 locations on NFS lands in USFS Region 2. It is not known to occur on the SJNF, but there is a known population on BLM land in the Silverton area, and there is habitat for this species on the SJNF (Colorado Natural Heritage Program 2012). The populations in Wyoming and Colorado are primarily in fens at elevations between 6,100 and 9,600 feet (Gage and Cooper 2006). Lesser panicled sedge is ranked globally secure (G5) by NatureServe and critically imperiled (S1) in Colorado. Activities that may occur on the SJNF with the most potential to impact lesser panicled sedge include livestock grazing, recreation, and solid mineral development.

## 3.2.5 Lesser Yellow Lady's Slipper Orchid (Cypripedium parviflorum)

Lesser yellow lady's slipper orchid is a yellow-flowered orchid found in boreal regions of the Northern Hemisphere. There are 224 known occurrences of lesser yellow lady's slipper orchid in USFS Region 2. Eleven of these are known to occur on NFS land in Colorado, two of which are found on the SJNF. The species can be found in a variety of habitats, including dry ponderosa pine habitat where soil moisture can be very low late in the growing season, as well as riparian areas, north slopes, and cool drainages that have moist to near saturated soil moisture throughout the growing season. Lesser yellow lady's slipper orchid is often found on soils and stony soils that have developed over a calcareous substrate, limestone scree and the base of limestone cliffs or in peaty soils. On the SJNF, lesser yellow lady's slipper orchid has been found at 8,000 feet elevation in an area dominated by cottonwood and aspen stands and at 8,000 feet in an area dominated by ponderosa pine, Gambel oak, and snowberry (Mergen 2006). Lesser yellow lady's slipper orchid is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities that may occur on the SJNF with the most potential to impact the species include recreation, fire management, and timber harvest.

# 3.2.6 Smith's Draba (Draba smithii)

Smith's draba is a slender perennial in the mustard family only known to occur in Alamosa, Archuleta, Custer, Las Animas, Mineral, and Saguache Counties in southern Colorado. There are 27 known occurrences of Smith's draba in Colorado, 25 of which are found on lands managed by the USFS. There is one known location of the SJNF. Smith's draba is found on rock outcrops and on talus slopes with little closely associated vascular vegetation, although lichen and mosses can be abundant. The species occurs on quartz porphyry and volcanic-derived soils. On the SJNF, Smith's draba has been found at 7,760 feet in elevation on cliff and talus slopes in both seep areas and in more xeric areas (Ladyman 2004a). Smith's draba is ranked globally imperiled (G2) by NatureServe and imperiled (S2) in Colorado. Activities that may occur on the SJNF with the most potential to impact Smith's draba include recreation, road maintenance, and noxious weed management

# 3.2.7 English Sundew (Drosera anglica)

English sundew is a member of the sundew family found in nutrient-poor fens. It is a carnivorous plant that derives a significant proportion of its nutrients from the absorption of animal tissues. English sundew has a circumboreal distribution and is widespread and abundant in many regions. The only known occurrences of this obligate wetland species in Region 2 are on the Shoshone National Forest in Wyoming and the SJNF in Colorado. The population on the SJNF is a geographically isolated population near the southern extent of the species' range in La Plata County on the Columbine Ranger District. On the SJNF, it is found in a basin fen at 8,500 feet in elevation (Wolf et al. 2006). English sundew is ranked globally secure (G5) by

NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact English sundew include any activities that alter the hydrologic functioning or nutrient budgets of fens where the species occurs. Activities that may occur on the SJNF with the most potential to alter the hydrologic functioning or nutrient budgets of fens include livestock grazing and recreation.

## 3.2.8 Stream Orchid (Epipactis gigantea)

Stream orchid is a pink-flowered orchid found from southern British Columbia through the western United States as far inland as Texas. There are 41 known occurrences of stream orchid in USFS Region 2. Most of these are on lands managed by the BLM or the National Park Service. Only two are on NFS lands: one on the Black Hills National Forest and one on the SJNF. Stream orchid occurs in desert, montane, and boreal climates, but is always restricted to nutrient-rich habitats that have a constant supply of moisture from sources such as thermal and non-thermal springs, seeps, and streams. On the SJNF, the known location of stream orchid is found in a hillside seep in a ponderosa pine/Douglas-fir forest at approximately 6,600 feet in elevation (Rocchio et al. 2006). Stream orchid is ranked globally apparently globally secure (G4) by NatureServe and imperiled to vulnerable (S2/S3) in Colorado. Activities that may occur on the SJNF with the most potential to impact stream orchid include livestock grazing, utility line maintenance, road maintenance, and noxious weed management.

## 3.2.9 Whitebristle Cottongrass (Eriophorum altaicum var. neogaeum)

Whitebristle cottongrass is a perennial in the sedge family. In bloom, it has a solitary flowering head whose fluffy bristles resemble a cotton ball. Whitebristle cottongrass is known from Asia and North America, but the variety *neogaeum* is restricted to Colorado. There are 29 known occurrences in Colorado, 25 of which are found on lands managed by the USFS. Eighteen of these known locations are on the SJNF, where it is always associated with water-saturated soils in bogs, fens, and wetlands at elevations between approximately 11,000 and 12,400 feet (Ladyman 2004b). The NatureServe global rank for whitebristle cottongrass is apparently secure (with some uncertainty) for the species *E. altaicum* and between vulnerable and apparently secure for the variety *neogaeum* (G4?T3T4). It is ranked vulnerable (S3) in Colorado. Activities on the SJNF with the most potential to impact whitebristle cottongrass include any that may impact the hydrology of areas where the species occurs. This could include livestock grazing, recreation, and solid mineral development.

# 3.2.10 Chamisso's Cottongrass (Eriophorum chamissonis)

Chamisso's cottongrass is a perennial in the Sedge family which appears very similar to whitebristle cottongrass in having a solitary flowering head that resembles a cotton ball. It is a circumpolar species that occurs in most of the northern tier of the U.S. states west of the Great Lakes, as well as all Canadian provinces and northern Eurasia. At the southern extent of its range in Region 2, it occurs in small, disjunct populations in subalpine wet meadows and fens with saturated peat soils, where graminoids and forbs dominate the vegetation. There are 12 known occurrences in Colorado and Wyoming, all of which are on NFS lands. Two of these known locations are on the SJNF, where it is found in high-elevation fens at elevations between approximately 11,560 and 11,820 feet (Decker et al. 2006a). Chamisso's cottongrass is ranked globally secure (G5) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact Chamisso's cottongrass include any that may impact the hydrology of areas where the species occurs. This could include livestock grazing, recreation, and solid mineral development.

# 3.2.11 Slender Cottongrass (Eriophorum gracile)

Slender cottongrass is a perennial in the sedge family with two to five flowering heads resembling cotton balls. It is a circumpolar species that occurs in the northern tier of U.S. states north of approximately 40 degrees latitude, as well as in all of the Canadian provinces and northern Eurasia. At the southern extent of its range in Region 2, it occurs in small, disjunct populations in fens and subalpine wet meadows with saturated soils from 7,000 to 11,140 feet in elevation. Of the 36 documented occurrences in Region 2, 15 are on NFS lands in Colorado and Wyoming, including nine in Colorado. Although slender cottongrass has not been documented to occur on the SJNF, there is suitable habitat for this species on the SJNF

(Decker et al. 2006b). Slender cottongrass is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact slender cottongrass include any that may impact the hydrology of areas where the species occurs. This could include livestock grazing, recreation, and solid mineral development.

## 3.2.12 Lone Mesa Snakeweed (Gutierrezia elegans)

Lone Mesa snakeweed is a yellow-flowered, shrubby member of the aster family first described in 2008. It is currently known from five occurrences in and around Lone Mesa State Park in southwest Colorado. One of these locations is on the Dolores Ranger District of the SJNF. Lone Mesa snakeweed is found on barren Mancos Shale outcrops, side slopes of shallow washes, and in sites with deeper soil over the shale at approximately 7,575 feet in elevation (Schneider et al. 2008). Lone Mesa snakeweed is ranked globally critically imperiled (G1) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact Lone Mesa snakeweed include potential water development of Plateau Creek, livestock grazing, recreation, oil and gas development, road maintenance, and noxious weed management.

## 3.2.13 Frosty Bladderpod (Lesquerella pruinosa)

Frosty bladderpod is a low-growing species in the mustard family. It is known from 21 occurrences in Archuleta and Hinsdale Counties in southwest Colorado and from one occurrence in northern Rio Arriba County, New Mexico. There are seven main populations of frosty bladderpod found on the Pagosa District of the SJNF. The largest population on the SJNF is found within the boundaries of the O'Neal Hill Special Botanical Area, which was designated to protect and preserve this species. Frosty bladderpod is limited to soils derived from the Upper Cretaceous Mancos Shale Formation between 6,890 and 8,800 feet in elevation (Anderson 2006). Frosty bladderpod is ranked globally imperiled (G2) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact frosty bladderpod include livestock grazing, solid mineral development, oil and gas development, road maintenance, and noxious weed management.

## 3.2.14 Colorado Tansyaster (Machaeranthera coloradoensis)

Colorado tansyaster is a perennial forb in the aster family endemic to central, west-central, and southwest Colorado and south-central Wyoming. Of the 33 known occurrences, 21 are on NFS lands in Colorado and Wyoming. Five of these are on the SJNF on the Columbine and Dolores Ranger Districts in alpine meadows at 11,400 to 12,600 feet. It is generally found in sparsely vegetated areas on rocky, exposed soils of sedimentary or volcanic origin (Hartman 1976) and is consistently found in areas with open exposure. However, the slope, aspect, and moisture vary from site to site (Beatty et al. 2004). Colorado tansyaster is ranked globally vulnerable (G3) by NatureServe and vulnerable (S3) in Colorado. Activities on the SJNF with the most potential to impact Colorado tansyaster include livestock grazing, recreation, or solid mineral development.

# 3.2.15 Kotzebue's Grass-of-Parnassus (Parnassia kotzebuei)

Kotzebue's grass-of-Parnassus is a small and inconspicuous member of the saxifrage family. It is a circumpolar species that grows in mesic to wet arctic and alpine habitats in the Northern Hemisphere and is found in scattered locations at high elevations in Washington, Nevada, Idaho, Montana, Wyoming, and Colorado. It is known from 27 locations in Region 2, covering approximately 27 acres and containing an estimated 1,135 plants. Kotzebue's grass-of-Parnassus is found primarily above the tree line and also in subalpine forest openings, on rocky coniferous slopes, and in deep spruce forests. In these areas, it is found growing in wet areas along streamlets and in moss mats. There is one documented location on the Columbine Ranger District of the SJNF at approximately 12,000 feet (Panjabi and Anderson 2007). Kotzebue's grass-of-Parnassus is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact Kotzebue's grass-of-Parnassus include any that may impact the hydrology of areas where the species occurs. This could include livestock grazing, recreation, or solid mineral development.

## 3.2.16 Cushion Bladderpod (Physaria pulvinata)

Cushion bladderpod is a member of the mustard family first described in 2006. It is currently known from two occurrences in San Miguel and Dolores Counties, Colorado, at approximately 7,500 feet in elevation (O'Kane and Reveal 2006). A portion of one of these populations is on the Dolores Ranger District of the SJNF. It is found on scattered outcrops of grayish, argillaceous shale (Anderson and Panjabi 2006), often in association with Lone Mesa snakeweed, another sensitive plant species on the Dolores Ranger District (Gildar 2013). Cushion bladderpod is ranked globally critically imperiled (G1) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact cushion bladderpod include potential water development of Plateau Creek, livestock grazing, recreation, oil and gas development, road maintenance, and noxious weed management.

## 3.2.17 West Silver Bladderpod (Physaria scrotiformis)

West silver bladderpod is a long-lived perennial forb of the mustard family first described in 2006. The entire known population of this low-growing species is found in one location on the SJNF on a windswept, nearly barren exposure of Leadville limestone in the Weminuche wilderness on the Columbine Ranger District at approximately 11,680 feet in elevation (O'Kane 2007). West silver bladderpod is ranked globally critically imperiled (G1) by NatureServe and critically imperiled (S1) in Colorado. The activity on the SJNF with the most potential to impact west silver bladderpod is recreation.

## 3.2.18 Arizona Willow (Salix arizonica)

Arizona willow is a willow species known to occur near the margins of the Colorado Plateau in Utah, Arizona, New Mexico, and Colorado. This subalpine species is typically found in high-elevation wet meadows, streamsides, and cienegas. According to Decker (2006b), known occurrences are confined to three primary centers of distribution in the White Mountains of east-central Arizona, the High Plateaus of south-central Utah, and the Southern Rocky Mountains of northern New Mexico and southern Colorado. In USFS Region 2, the only known occurrence is found on the Rio Grande National Forest along a stream at approximately 10,300 feet in elevation. There is potential habitat for Arizona willow on the SJNF. Arizona willow is frequently associated with substrates of volcanic origin, and it appears to favor coarse-textured and well-watered soils, including those associated with alluvial deposits (Decker 2006b). Arizona willow is ranked globally imperiled to vulnerable (G2/G3) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact Arizona willow include activities that can cause hydrologic alterations such as livestock grazing and recreation.

# 3.2.19 Sageleaf Willow (Salix candida)

Sageleaf willow is a willow species with a boreal distribution, concentrated in Canada and the northern tier of the United States, including Alaska. Sageleaf willow is typically found in fens, bogs, marshes, and other areas of permanently saturated soils where peat is present, especially those characterized as "rich" or "extreme rich" fens. It is known from 32 locations within USFS Region 2, 16 of which are located on NFS lands. Survey work from 1985 indicated that this species was present on the SJNF, but since no specimens were collected to document these occurrences and botanists have been unable to relocate the occurrences, there is some question regarding the accuracy of these reports (Decker 2006c). Regardless, there is suitable habitat for this species on the SJNF. Within Colorado, this species occurs at elevations between 8,900 and 10,040 feet. Sageleaf willow is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact sageleaf willow include activities that can cause hydrologic alterations to the fens where this species is located such as livestock grazing and recreation.

# 3.2.20 Autumn Willow (Salix serissima)

Autumn willow is a boreal willow with known populations concentrated in the northeastern United States and in Canada from Newfoundland to British Columbia. Autumn willow is typically found in areas with permanently saturated soils where peat is present, such as fens. However, given the lack of habitat information included with some specimens, it cannot be ruled out that this species may also occur in other

moist habitats such as stream banks. It is known from five locations on NFS lands within USFS Region 2, one of which is potentially on the SJNF at approximately 8,300 feet in elevation (Decker 2006d). Autumn willow is ranked globally apparently secure (G4) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact autumn willow include impacts from activities that might cause hydrologic alterations to the fens were this species is located such as livestock grazing and recreation.

## 3.2.21 Sphagnum Moss (Sphagnum angustifolium)

Sphagnum moss is a moss species found in Europe, across Canada, and in the northern tier of the United States, including Alaska. It is known from both Wyoming and Colorado within USFS Region 2 (Austin 2007). As of 2012, there were nine known occurrences of sphagnum moss on the Columbine Ranger District of the SJNF (Colorado Natural Heritage Program 2012). This species is typically found in iron fens and poor fens (Austin 2007) between approximately 9,500 and 11,600 feet in elevation (Colorado Natural Heritage Program 2012). Sphagnum moss is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to sphagnum moss include impacts from activities that might cause hydrologic alterations to the fens were this species is located such as livestock grazing, recreation, or solid mineral development.

## 3.2.22 Baltic Bog Moss (Sphagnum balticum)

Baltic bog moss is a moss species found in Wales, Northern England, Scotland, and Canada. There are only two known populations of this species in the United States, both of which are in Colorado on the Columbine Ranger District on the SJNF, where it occurs in the wet portions of iron fens (Austin 2009) at approximately 9,620 to 10,280 feet in elevation (Colorado Natural Heritage Program 2012). Baltic bog moss is ranked globally imperiled to globally apparently secure (G2/G4) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact Baltic bog moss include impacts from activities that might cause hydrologic alterations to the fens where this species is located such as livestock grazing, recreation, or solid mineral development.

# 3.2.23 Largeflower Triteleia (Triteleia grandiflora)

Largeflower triteleia is a perennial plant in the onion family that has been reported from Washington, Oregon, northern California, Idaho, Wyoming, Utah, and southwest Colorado. The only known location of this species on NFS lands in USFS Region 2 is on the Dolores Ranger District on the SJNF. At this site, it is found in open to partially shaded patches in a ponderosa pine/Gambel oak community at approximately 7,900 to 7,960 feet in elevation (Ladyman 2007). Largeflower triteleia is ranked globally apparently secure to secure (G4/G5) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact largeflower triteleia include livestock grazing, recreation, oil and gas development, fire management, timber harvest, and mechanical fuels treatments.

# 3.2.24 Lesser Bladderwort (Utricularia minor)

Lesser bladderwort is a small, perennial, yellow-flowered, aquatic species in the bladderwort family that grows affixed to substrate (as opposed to being free-floating). It grows in a variety of low-energy aquatic environments such as shallow water, inundated mudflats, or areas with emergent vegetation. It is a circumboreal species found primarily in North America, Europe, and Asia. In USFS Region 2, it is found on the SJNF and Grand Mesa and Routt National Forests (Neid 2006). On the SJNF, lesser bladderwort occurs in a small creek that is the outflow from a lake on the Dolores Ranger District. Lesser bladderwort is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact lesser bladderwort include any activities that alter the hydrologic functioning or degrade water quality of areas where this species occurs. Activities on the SJNF with the most potential to impact lesser bladderwort include livestock grazing and recreation.

# 3.3 Effects Analysis

Implementing a sustainable ecosystems strategy that maintains sustainable ecosystems and existing habitats for sensitive plant species on SJNF would protect and sustain those ecosystems and the diversity and viability of the majority of plant species within them (including sensitive plant species). Of the 24 sensitive plant species known to occur or with habitat on the SJNF, 16 occur within areas well represented in protected areas (including fens, high-elevation wetlands, and alpine habitat). The remaining eight species are found at lower elevations in habitats poorly represented or entirely absent from protected areas. This includes but is not limited to hanging gardens, low-elevation riparian areas and wetlands, and specific soil types such as gypsum and Mancos Shale soils.

Management activities that could have impacts on sensitive plant species on the SJNF include livestock grazing, recreation, solid mineral development (mining), oil and gas development, fire management, timber harvest, and mechanical fuels treatments. Other actions such as road maintenance or noxious weed management may also have an impact on sensitive plant species. Impacts would depend on many factors, including the extent, timing, frequency, and duration of activities. Impacts to sensitive plant species from management activities would be reduced, minimized, or prevented by the implementation of standards, guidelines, and stipulations in the LRMP, the implementation of project-specific mitigation measures, and by following direction in the Watershed Conservation Practices Handbook (Forest Service Handbook [FSH] 2509.25), the ESA, FSM 2622, and FSM 2070. Impacts from the activities listed above are discussed in more detail below.

## 3.3.1 Livestock Grazing

Livestock grazing may have impacts to USFS sensitive plant species that occur in the habitats where grazing may occur. Past livestock grazing has had a significant impact on the current conditions seen in the many of the terrestrial ecosystems on the SJNF, particularly mountain grasslands, semi-desert shrublands, semi-desert grasslands, sagebrush shrublands, and pinyon-juniper woodlands. The sensitive plant species that occur in these lower-elevation terrestrial ecosystems are the most likely to be impacted by livestock grazing. This includes Missouri milkvetch, Aztec milkvetch, Lone Mesa snakeweed, frosty bladderpod. Colorado tansvaster, cushion bladderpod, and largeflower triteleia. For these species, there is a standard in the LRMP requiring that projects or activities occurring on shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species. Many wetlands and riparian areas have also been impacted by past and current livestock grazing and water development. The sensitive plant species present in these areas and most likely to be impacted by livestock grazing include lesser panicled sedge, English sundew, stream orchid, whitebristle cottongrass, Chamisso's cottongrass, slender cottongrass, Kotzebue's grassof-Parnassus, Arizona willow, sageleaf willow, autumn willow, sphagnum moss, Baltic bog moss, and less bladderwort. There is a standard in the LRMP requiring that projects or activities occurring in fens, wetlands, or hanging gardens occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

There has also been a significant reduction in the numbers of cattle and sheep that graze on the SJNF since the early 1900s. For example, in the 1930s, approximately 216,684 sheep and 41,968 cattle were permitted on the SJNF. In 2012, approximately 14,330 sheep and 23,412 cattle were permitted. In addition, there are also fewer acres available for livestock grazing than there were in the past. Currently, a little over half of the SJNF is considered suitable for livestock grazing. The combination of fewer numbers of livestock, fewer acres available for grazing, the use of the guidelines mentioned above, and other project-specific design criteria and mitigation measures during project-level planning would help minimize impacts to sensitive species at the project level.

Proposed stocking rates and the amount of area available for permitted livestock grazing varies between alternatives. Alternative D has the potential to impact the highest number of acres and proposes the highest cattle stocking rates, and therefore has the most potential to impact sensitive plant species. Alternative B has the next highest potential to impact sensitive plant species, followed by Alternatives A then C due to incrementally lower numbers of permitted cattle and fewer acres considered suitable for grazing.

## 3.3.2 Recreation

Recreation impacts to USFS sensitive plant species are possible from activities such as camping, hiking, mountain biking, horseback riding, and motorized recreation. Recreation use is widespread and would occur to some extent in all of the terrestrial ecosystems on the SJNF, but impacts are typically confined to localized areas such as designated trails, frequently used campsites, or developed recreation facilities such as campsites or trailheads. The species most likely to be impacted by recreation activities include those with known populations near frequently used areas, such as trails, near popular lakes or wetland areas and in or near developed recreation sites. The potential for dispersed recreation in many areas also makes the potential for impacts to sensitive plant species more likely. The species most likely to be impacted by recreation activities include stonecrop gilia, Aztec milkvetch, lesser panicled sedge, lesser vellow lady's slipper orchid, Smith's draba, English sundew, whitebristle cottongrass, Chamisso's cottongrass, slender cottongrass, Lone Mesa snakeweed, Colorado tansyaster, Kotzebue's grass-of-Parnassus, cushion bladderpod, Arizona willow, sageleaf willow, autumn willow, sphagnum moss, Baltic bog moss, largeflower triteleia, and lesser bladderwort. There are standards in the LRMP requiring that projects or activities occurring in fens, wetlands, and hanging gardens occupied by sensitive plant species, and on shale and gypsum soils occupied by sensitive plant species, be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species. Use of these design criteria during project-level planning would help minimize impacts to sensitive species, but impacts from dispersed recreation are still possible.

While the actual direct impacts from different types of recreation use are similar for all alternatives, the amount of area potentially impacted varies by alternative, primarily because of differences in the number acres that would be designated as suitable for motorized use. Alternative A has the most amount of area designated as suitable for motorized recreation and is the only alternative that allows motorized travel off of designated routes, and therefore has the potential to impact sensitive plant species that may be present in these areas. Alternative D has the second highest amount of area designated as suitable for motorized recreation, followed by Alternative B. Alternative C has the fewest number of acres designated as suitable for motorized recreation and therefore has the potential to impact sensitive plant species on the fewest number of acres.

# 3.3.3 Solid Minerals Development

Currently on the SJNF, some small-scale solid mineral development is possible in the alpine terrestrial ecosystems around Silverton and in a variety of terrestrial ecosystems around the Rico and La Plata areas. Small-scale rock collecting is also possible in many areas across the SJNF. Solid mineral development may have impacts to USFS sensitive plant species that occur in the project areas where mining or rock collecting are most likely to occur. The sensitive plant species most likely to be impacted by solid mineral development are those that are near the areas most likely to experience solid mineral development and include Missouri milkvetch, Aztec milkvetch, lesser panicled sedge, whitebristle cottongrass, Chamisso's cottongrass, slender cottongrass, Colorado tansyaster, Kotzebue's grass-of-Parnassus, sphagnum moss, and Baltic bog moss. For USFS sensitive plant species, there are standards requiring that projects or activities occurring in fens, wetlands, and hanging gardens occupied by sensitive plant species, and on shale and gypsum soils occupied by sensitive plant species, be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species. These design criteria can be used in operating plans to help minimize potential impacts to sensitive plant species from solid mineral development. In addition, federal authority over mining activities allows for the setting of terms and conditions in operating plans in order to minimize impacts to public lands. There are also areas that have been withdrawn from leasing or are administratively unavailable for leasing that would not be impacted by solid mineral development. Currently, there are 424,428 acres on the SJNF which have been withdrawn from leasing. In addition, the opportunity for new solid mineral development within the roughly 566,000 acres of CRAs is somewhat limited because new road construction is prohibited, unless there is a prior existing right. The standards in the LRMP, the withdrawal of areas from leasing, and the limited opportunity for solid mineral development in CRAs all combine to minimize the impact of solid mineral development on sensitive plant species.

The number of acres available for solid minerals development varies by approximately 10,000 acres between alternatives. Alternative C has the fewest number of acres open to locatable mineral development, and the highest number of acres proposed for withdrawal, and thus would have the least amount of potential impact on sensitive plant species. Alternative B has more acres available for mineral development and fewer acres proposed for withdrawal as compared to Alternative C. Alternatives A and D have the most acres available for locatable mineral development and do not propose the withdrawal of any additional areas from mineral development, and would therefore have the most potential to impact sensitive plant species. The number of acres currently withdrawn from possible solid mineral development is the same for each alternative.

## 3.3.4 Oil and Gas Development

Impacts to USFS sensitive plant species and suitable habitat for these species are possible during oil and gas development. The sensitive plant species most likely to be impacted by oil and gas development are those that occur at lower elevations of the SJNF and include Missouri milkvetch, Aztec milkvetch, Lone Mesa snakeweed, frosty bladderpod, cushion bladderpod, and largeflower triteleia. Many known populations of USFS sensitive plant species and suitable habitat for these species occur in areas that are currently under lease. In areas already under lease, but not yet developed, standard lease terms can be used to move the location of a well or access road prior to development to help prevent or minimize impacts to USFS sensitive plant species and their suitable habitat. The standard in the LRMP requiring that activities in shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species can also be used to condition the approval of development on existing leases. In new lease areas, impacts to USFS sensitive plant species and suitable habitat for these species would be minimized by the application of standard lease terms, or prevented by the application of special lease stipulations, depending on alternative. Alternative C offers the highest level of protection to sensitive plant species because it is the only alternative that allows the application of an NSO stipulation on lands occupied by sensitive species and within a 325-foot buffer around those lands. Alternative B allows for a CSU stipulation to be applied to new leases. Under Alternatives A and D, only standard lease terms can be applied.

Overall, oil and gas development under the No Leasing Alternative would have the least amount of impact on sensitive plant species since impacts would only occur in areas that are already under lease. Areas not currently under lease would not be impacted under the No Leasing Alternative. In regards to Alternatives A through D, Alternative C would have the least amount of impact on sensitive plant species. Alternative C has the highest number of acres that are withdrawn from leasing or are administratively unavailable for leasing (Table T.14), and the special leasing stipulations available under this alternative offer the highest level of resource protection available to sensitive plant species (Table T.15). Alternative B offers the second highest number of acres withdrawn or unavailable for leasing and the second highest level of protection to sensitive plant species from special leasing stipulations. Alternative A offers the third. Alternative D has the fewest number of acres that are withdrawn from leasing or are administratively unavailable for leasing, and the lowest level of protection offered by special leasing stipulations.

Table T.14: Acres Withdrawn from Leasing or Administratively Not Available for Leasing by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing
					Alternative
		USFS			
Federal mineral acres	1,863,402	1,863,402	1,863,402	1,863,402	1,863,402
Acres withdrawn from leasing	509,954	509,954	509,954	509,954	509,954
Acres administratively not	16,357	73,636	644,113	14,896	1,353,448
available for leasing					
Acres available for leasing	1,337,090	1,279,811	709,335	1,338,551	0

**Table T.15: Special Leasing Stipulations Related to Sensitive Plant Species** 

Stipulation	Alternative A	Alternative B	Alternative C	Alternative D
Region 2 Regional Forester's sensitive species	SLT	CSU	NSO	SLT
Special botanical areas	CSU	NSO	NSO	CSU
Lands with slopes of 25 to 35% and shale soils	SLT	CSU	NSO	SLT
Lands with gypsum soils SLT CSU NSO SLT				
NSO = No Surface Occupancy; CSU = Controlled Surface Use; SLT = Standard Lease Terms				

## 3.3.5 Fire Management

Management-ignited fires, wildfires, and fire suppression would have impacts to terrestrial ecosystems, sensitive plant species, and soils on the SJNF. Prior to Euro-American settlement, fire played an important role in creating and maintaining the vegetation communities in many terrestrial ecosystems, especially ponderosa pine and warm-dry mixed conifer forests. Fire suppression has contributed to the many changes seen in these ecosystems over the past 100 years. The use of management-ignited fires and the appropriate management of naturally ignited wildfires would help to restore the composition and structure of ecosystems and maintain or restore the heterogeneous structure and pattern of the vegetation that was present on the SJNF during the reference period, including sensitive plant species. Fire management has the potential to impact all of the sensitive plant species on the SJNF, but those species found in ponderosa pine and warm-dry mixed conifer forests (Missouri milkvetch, Aztec milkvetch, lesser yellow lady's slipper orchid, and largeflower triteleia) have the most potential to be impacted. Project-specific design criteria can be used during project-level planning to help minimize impacts to sensitive plant species. In addition, there is a standard in the LRMP requiring that projects or activities occurring on shale soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

The amount of area proposed for management-ignited fire is the same under each alternative (between 3,000 and 7,000 acres per year), so the impacts to sensitive plant species would be the same under each alternative. Up to 20,000 acres of the SJNF could be impacted by fires managed for resource benefit under Alternative A. Fires managed for resource benefit could impact the sensitive plant species on an additional 30,000 acres of the SJNF under Alternatives B, C, and D.

## 3.3.6 Timber Harvest and Mechanical Fuels Treatments

Impacts from timber harvest would occur in spruce-fir, aspen, cool-moist mixed conifer, warm-dry mixed conifer, and ponderosa pine forests. Impacts from mechanical fuels treatment are most likely to occur in warm-dry mixed conifer forests, ponderosa pine forests, pinyon-juniper woodlands, and mountain shrublands. These activities may have impacts to sensitive plant species that occur in the habitats where treatments may occur, including Missouri milkvetch, Aztec milkvetch, lesser yellow lady's slipper orchid, and largeflower triteleia. Project-specific design criteria can be used during project-level planning to help minimize impacts to sensitive plant species at the project level. In addition, there is a standard in the LRMP requiring that projects or activities occurring on shale soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

Timber harvest under Alternative D would impact the vegetation and soils on approximately 3,750 acres of per year, followed by Alternatives B at 2,675 acres, and Alternative A at 2,650 acres. Alternative C would impact the vegetation and soils on the fewest acres per year (2,165 acres). While Alternatives A, B, and C would impact the vegetation and soils on fewer acres, there would also be less opportunity under these alternatives to use mechanical fuels treatments for ecosystem restoration purposes than under Alternative D.

Mechanical fuels treatments under Alternative D would impact the vegetation and soils on approximately 7,700 acres per year, while Alternatives A, B, and C would each impact approximately 6,700 acres per year. Alternatives A, B, and C would impact the vegetation and soils on fewer acres, but there would be less opportunity under these alternatives to use mechanical fuels treatments for ecosystem restoration purposes than under Alternative D.

## 3.3.7 Cumulative Impacts

Past management activities (including fire management, timber harvest, mechanical fuels treatments, livestock grazing, oil and gas development, solid minerals development, and recreation) on federal and non-federal lands within the planning area caused impacts to sensitive plant species as described above. Many of the impacts associated with those activities (soils disturbances) have recovered due to restoration efforts and natural processes. Many other adverse impacts (particularly those associated with fire management and livestock grazing) are still evident on the SJNF and would remain evident over the next 15 years. Project designs and the proper implementation of mitigation measures, conditions of approval, stipulations, standards, and guidelines served to protect the composition, structure, and function of sensitive plant species on most past projects.

Additional impacts to sensitive plant species (as described above) on federal and non-federal lands within the planning area would occur from the implementation of management activities in the LRMP and from foreseeable future management activities beyond the 15-year life of the LRMP. Those impacts are anticipated to be localized and would not adversely affect the ecological integrity of most areas or the diversity or viability of sensitive plant species.

The cumulative impact of past, present, and foreseeable future management activities on federal and non-federal lands within the planning area could cause impacts to sensitive plant species, as described above, on a small percent of the planning area. Those impacts would not adversely affect the diversity or viability of sensitive plant species. Project design, the implementation of standards, guidelines, and stipulations in the LRMP, project level analysis, and the implementation of mitigation measures at the project level would minimize adverse cumulative impacts to sensitive plant species on federal lands.

## 3.3.8 Determination Statement

It is the USFS's determination that implementation of any of the alternatives and activities associated with this FEIS may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing for the Region 2 Regional Forester's sensitive plant species known to occur or likely to occur on the SJNF. This includes stonecrop gilia, Missouri milkvetch, Aztec milkvetch, lesser panicled sedge, lesser yellow lady's slipper orchid, Smith's draba, English sundew, stream orchid, whitebristle cottongrass, Chamisso's cottongrass, slender cottongrass, Lone Mesa snakeweed, frosty bladderpod, Colorado tansyaster, Kotzebue's grass-of-Parnassus, cushion bladderpod, west silver bladderpod, Arizona willow, sageleaf willow, autumn willow, sphagnum moss, Baltic bog moss, largeflower triteleia, and lesser bladderwort.

This determination is based on the fact that project-specific design criteria can be used during project-level planning to help prevent or minimize impacts to sensitive plant species at the project level. In addition, the application of standards and guidelines in the LRMP related to sensitive plant species and their habitat, the application of standard lease stipulations and special lease stipulations such as NSO and CSU, withdrawal of certain areas from leasing for oil and gas development and/or solid mineral development, and the setting of terms and conditions in operating plans for solid mineral development would all help prevent or minimize impacts to sensitive plant species. Effects to sensitive plant species from management activities could occur under all of the alternatives. Since Alternative D proposes the most active management, it has the greatest potential to affect sensitive plant species as described above, compared to the other alternatives. Alternative A has the next highest potential to affect sensitive plant species since it proposes the second most active management, followed by Alternative B. Alternative C has the least potential to affect sensitive plant species as described above, since it proposes the least active management.

# 4 BUREAU OF LAND MANAGEMENT SENSITIVE PLANT SPECIES ANALYSIS

# 4.1 Plant Species Considered and Evaluated

Table T.16 lists the sensitive plant species evaluated by the BLM for the TRFO portion of the planning area.

Table T.16: Bureau of Land Management Sensitive Plant Species Considered and Evaluated for the Tres Rios Field Office

Sensitive Plant Species	Habitat Association or Vegetation Type
Jones' bluestar	Pinyon-juniper woodlands and desert shrub in runoff-fed draws on sandstone
Amsonia jonesii	
Naturita milkvetch	Pinyon-juniper woodlands (grows in the cracks of sandstone bedrock, associated
Astragalus naturitensis	with biological soil crusts)
Schmoll's milkvetch	Mature pinyon-juniper woodlands on mesa tops in the Mesa Verde area
Astragalus schmolliae*	
Gypsum Valley cateye	Pinyon-juniper, desert grasslands and desert shrublands on gypsum soils
Cryptantha gypsophila	
Fragile rockbrake	Riparian/wetlands (cliff crevices and seeps in calcareous soils)
Cryptogramma stelleri	
Kachina daisy	Riparian/wetlands (saline soils in alcoves and seeps in desert canyon walls)
Erigeron kachinensis	
Comb Wash buckwheat	Semi-desert shrublands with shadscale saltbush, on shale soils
Eriogonum clavellatum	
Lone Mesa snakeweed	Pinyon-juniper, semi-desert shrubland, sagebrush (barren Mancos Shale outcrops)
Gutierrezia elegans	
Frosty bladderpod	Mountain grasslands and mountain shrublands (soils derived from Mancos Shale)
Lesquerella pruinosa	
Dolores River skeletonplant Lygodesmia doloresensis	Pinyon-juniper, semi-desert shrublands with shadscale, and sagebrush communities on reddish, purple, sandy alluvium and colluvium of the Cutler Formation between the canyon walls and the Dolores river
Eastwood's monkeyflower	Riparian/wetland (shallow caves and seeps on canyon walls, hanging gardens)
Mimulus eastwoodiae	
Aromatic Indian breadroot	Semi-desert shrublands and sagebrush shrublands
Pediomelum aromaticum	
Cushion bladderpod	Pinyon-juniper, semi-desert shrubland, sagebrush (barren shale outcrops)
Physaria pulvinata	
*Candidate Species	

# 4.2 Species Evaluations

# 4.2.1 Jones' Bluestar (Amsonia jonesii)

Jones' bluestar is a member of the dogbane family. It is a tap-rooted perennial with powder-blue, tubular flowers. It is found in northeast Arizona, Utah, northwest New Mexico, and southwest Colorado (in Mesa and Montezuma Counties) (Spackman and Anderson 2002). There are six known occurrences of this species in Colorado (Colorado Natural Heritage Program 2013). There are no known occurrences of this species on the TRFO outside the Canyons of the Ancients National Monument (Colorado Natural Heritage Program 2013), but there is suitable habitat. This species grows in dry, open areas with clay, sandy or gravelly soils in desert-steppe, rocky gorges, and canyons between 4,500 and 5,000 feet (Spackman and Anderson 2002). Jones' bluestar is ranked globally apparently secure (G4) by

NatureServe, and it is considered critically imperiled (S1) in Colorado. Activities that may occur on the TRFO with the most potential to impact Jones' bluestar habitat include livestock grazing, recreation, and mineral and energy development.

## 4.2.2 Naturita Milkvetch (Astragalus naturitensis)

Naturita milkvetch is a small, low-growing perennial in the pea family. It has greenish gray foliage with white and purple flowers on ascending stems. It occurs in southeast Utah, northwest Arizona, and southwest Colorado (Mesa, Montezuma, Montrose, and San Miguel Counties) (Spackman and Anderson, 2002). There are 44 known locations in Colorado, 14 are on the TRFO (Colorado Natural Heritage Program 2013). Occurrences of this species are associated with sandstone mesa, ledges, crevices, and slopes in pinyon-juniper woodlands from 5,000 to 7,000 feet (Spackman and Anderson 2002). Naturita milkvetch is ranked as imperiled or vulnerable (G2G3) by NatureServe. It is considered imperiled or vulnerable (S2S3) in Colorado. Activities that may occur on the TRFO with the most potential to impact Naturita milkvetch include recreation, mineral and energy development, and vegetation management.

## 4.2.3 Schmoll's Milkvetch (Astragalus schmolliae)

Schmoll's milkvetch is an upright perennial plant with stems branching from an underground root crown. Its leaves and stems are covered in short hairs, making it appear ash-colored. It has creamy white flowers. Known populations of Schmoll's milkvetch are limited to 4,000 acres in Mesa Verde National Park and the adjacent Ute Mountain Ute Tribal Park on mesa tops on deep, reddish loess soils. There are no known populations on the TRFO, but there is suitable habitat. Schmoll's milkvetch is a federal candidate species, which the BLM treats as a sensitive species. It is ranked as globally critically imperiled (G1) by Natureserve and critically imperiled (G1) in Colorado. The activities with the most potential to impact Schmoll's milkvetch habitat include recreation, livestock grazing, mineral and energy development, and vegetation management.

## 4.2.4 Gypsum Valley Cateye (Cryptantha gypsophila)

Gypsum Valley cateye is a perennial forb in the forget-me-not family. It is a low-growing, tufted plant with leaves that are hairy on the front and smooth on the back. It can be distinguished from a very similar species, *C. paradoxa*, because *C. paradoxa* is hairy on both the front and back of the leaf and because Gypsum Valley cateye is restricted to gypsum soils (Reveal and Broom 2006). It has white tube-shaped flowers with yellow centers. Gypsum Valley cateye is a newly discovered, local endemic species whose global distribution is limited to 16 occurrences in San Miguel, Montrose, and Mesa Counties of Colorado (Reveal and Broom 2006). On the TRFO, there are 14 occurrences (Colorado Natural Heritage Program 2013), five of which are found within the proposed Gypsum Valley Area of Critical Environmental Concern, which was proposed in part to protect this species and its habitat. It is only found in pinyon-juniper, desert grasslands and desert shrublands on gypsum soils on the Paradox Member of the Hermosa Formation at approximately 6,300 feet (Reveal and Broom 2006). Gypsum Valley cateye is ranked globally imperiled (G2) by NatureServe and imperiled (S2) in Colorado. Activities that may occur on the TRFO with the most potential to impact Gypsum Valley cateye include mineral and energy development and motorized recreation.

# 4.2.5 Fragile Rockbrake (Cryptogramma stelleri)

Fragile rockbrake is a delicate, slender fern with a creeping rhizome. It is found in boreal habitats in North America, northeastern Europe, and Asia (Morin 1994). Fragile rockbrake grows on moist, shaded cliffs and ledges in coniferous forest on calcareous soils (Morin 1994). There are 17 occurrences in Colorado, 16 of which are on public lands (Colorado Natural Heritage Program 2013). There are no occurrences on the TRFO, but there are occurrences on adjacent SJNF lands (Colorado Natural Heritage Program 2013). The TRFO does contain suitable habitat for the species. Fragile rockbrake is ranked globally secure (G5) by NatureServe and imperiled (S2) in Colorado. Generally, there are no active management activities that have likelihood to affect fragile rockbrake because it grows in areas where active management is uncommon.

## 4.2.6 Kachina Daisy (Erigeron kachinensis)

Kachina daisy is a small perennial forb in the aster family. Its global range is restricted to San Juan County in Utah and in Montrose County in Colorado (Allphin and Harper 1997). There is one known location of the TRFO (Colorado Natural Heritage Program 2013). Kachina daisy is found on saline soils in alcoves and seeps on canyon walls (Spackman and Anderson 2002) and forms hanging gardens. Kachina daisy is ranked globally imperiled (G2) by NatureServe and critically imperiled (S1) in Colorado. Activities that may occur on the TRFO with the most potential to impact Kachina daisy include any activities that alter the hydrologic functioning of hanging gardens. Activities that may occur on the TRFO with the most potential to alter hydrologic function of hanging gardens include mineral and energy development and water developments.

## 4.2.7 Comb Wash Buckwheat (Eriogonum clavellatum)

Comb Wash buckwheat is a subshrub in the buckwheat family with spreading stems and white flowers. Its global distribution is limited to a few sites in the Four Corners area of San Juan County, Utah, Montezuma County, Colorado, and San Juan County, New Mexico (Reveal 2005). There are eight occurrences in Colorado, all on Ute Mountain Ute Reservation (Colorado Natural Heritage Program 2013). There are no known occurrences on the TRFO, but there is suitable habitat. Comb Wash buckwheat is ranked globally imperiled (G2) by NatureServe and critically imperiled (S1) in Colorado. Activities that may occur on the SJNF with the most potential to impact Comb Wash buckwheat include mineral and energy development, motorized recreation, road maintenance, and livestock grazing.

## 4.2.8 Lone Mesa Snakeweed (Gutierrezia elegans)

Lone Mesa snakeweed is a yellow-flowered, shrubby member of the aster family first described in 2008. It is currently known from five occurrences in and around Lone Mesa State Park in southwest Colorado. One of these locations is on the TRFO and the adjacent Dolores Ranger District of the SJNF (Colorado Natural Heritage Program 2013). Lone Mesa Snakeweed is found on barren Mancos Shale outcrops, side slopes of shallow washes, and in sites with deeper soil over the shale at approximately 7,575 feet in elevation (Schneider et al. 2008). Lone Mesa Snakeweed is ranked globally critically imperiled (G1) by NatureServe and critically imperiled (S1) in Colorado. Activities on the TRFO with the most potential to impact Lone Mesa Snakeweed include potential water development of Plateau Creek, livestock grazing, and road maintenance.

# 4.2.9 Frosty Bladderpod (Lesquerella pruinosa)

Frosty bladderpod is a low growing species in the mustard family. It is known from 21 occurrences in Archuleta and Hinsdale Counties in southwest Colorado and from one occurrence in northern Rio Arriba County, New Mexico. There are no known populations on the TRFO (Colorado Natural Heritage Program 2013); however, there is suitable habitat. There are seven main populations of frosty bladderpod found on the Pagosa District of the SJNF, some in adjacent parcels to the TRFO (Colorado Natural Heritage Program 2013). The largest population on the SJNF is found within the boundaries of the O'Neal Hill Special Botanical Area on the SJNF, which was designated to protect and preserve this species. Frosty bladderpod is limited to soils derived from the Upper Cretaceous Mancos Shale Formation between 6,890 and 8,800 feet (Anderson 2006). Frosty bladderpod is ranked globally imperiled (G2) by NatureServe and imperiled (S2) in Colorado. Activities on the TRFO with the most potential to impact frosty bladderpod habitat include livestock grazing and vegetation management activities such as mechanical fuels treatments and prescribed fire.

# 4.2.10 Dolores River Skeletonplant (Lygodesmia doloresensis)

Dolores River skeletonplant is a perennial forb in the aster family with rose-colored flowers surrounded by wispy leaves. This species is known from a 10-mile stretch of the Dolores River Canyon in Mesa County, Colorado, and a 5-mile stretch of the Colorado River Canyon in Grand County, Utah (NatureServe 2013). However, the Dolores Canyon, where most of the known plants occur, is heavily grazed by cattle. Dolores River skeletonplant is thus found only in sites that are physically inaccessible to cattle (NatureServe

2013). There are no known populations on the TRFO (Colorado Natural Heritage Program 2013), but there is suitable habitat. This species is found in mixed juniper-desert shrub and juniper-grassland communities on alluvial soils at elevations of 4,400 to 4,800 feet (O'Kane 1988). Soils are derived from sandstone outcrops associated with the undivided lower portion of the Cutler Group (NatureServe 2013). Dolores River skeletonplant is ranked globally critically imperiled or imperiled (G1G2) by NatureServe and critically imperiled (S1) in Colorado. Activities on the SJNF with the most potential to impact Dolores River skeletonplant habitat include livestock grazing.

## 4.2.11 Eastwood's Monkeyflower (Mimulus eastwoodiae)

Eastwood's monkeyflower is a small, perennial forb in the snapdragon family. It is endemic to the canyon lands of southeastern Utah and adjacent Colorado, Arizona, and New Mexico (Cronquist et al. 1984; Heil et al. 2002). It is known from 11 locations in Colorado, all of which are on public lands and four of which are on the TRFO (Colorado Natural Heritage Program 2013). Eastwood's monkeyflower is found in moist seeps and hanging garden communities in sandstone cliffs. Eastwood's monkeyflower is ranked globally vulnerable or apparently secure but rare in some parts of its range (G3G4) by NatureServe and critically imperiled (S1) in Colorado. Activities that may occur on the TRFO with the most potential to impact Eastwood's monkeyflower include any activities that alter the hydrologic functioning of hanging gardens. Activities that may occur on the TRFO with the most potential to alter hydrologic function of hanging gardens include mineral and energy development and water developments.

## 4.2.12 Aromatic Indian Breadroot (Pediomelum aromaticum)

Aromatic Indian breadroot is a taprooted perennial forb of the pea family. This species is known from Mesa and Montrose Counties in Colorado (Weber and Wittmann 2001); Mohave County, Arizona; and San Juan, Washington, Emery and Grand Counties, Utah (Welsh et al. 1993). There are 12 occurrences in Colorado. All occur on public lands with one occurrence (possibly historical) on TRFO lands (Colorado Natural Heritage Program 2013). Aromatic Indian breadroot is ranked globally vulnerable (G3) by NatureServe and imperiled (S2) in Colorado. Activities on the SJNF with the most potential to impact aromatic Indian breadroot include livestock grazing, mineral and energy development, and recreation.

# 4.2.13 Cushion Bladderpod (Physaria pulvinata)

Cushion bladderpod is a member of the mustard family first described in 2006. It is currently known from two occurrences in San Miguel and Dolores Counties, Colorado, at approximately 7,500 feet in elevation (Colorado Natural Heritage Program 2013). A portion of one of these populations is on the TRFO and also on the adjacent Dolores Ranger District of the SJNF (Colorado Natural Heritage Program 2013). It is found on scattered outcrops of grayish, argillaceous shale (Anderson and Panjabi 2006), often in association with Lone Mesa snakeweed, another sensitive plant species on the TRFO (Gildar 2013). Cushion bladderpod is ranked globally critically imperiled (G1) by NatureServe and critically imperiled (S1) in Colorado. Activities on TRFO with the most potential to impact cushion bladderpod include potential water development of Plateau Creek, livestock grazing, and road maintenance.

# 4.3 Effects Analysis

Implementing a sustainable ecosystems strategy that maintains sustainable ecosystems and existing habitats for sensitive plant species on the TRFO would protect and sustain those ecosystems and the diversity and viability of the majority of plant species within them (including sensitive plant species). Of the 12 sensitive plant species known to occur or with habitat on the TRFO, one occurs within areas well represented in protected areas (including fens, high-elevation wetlands, and alpine habitat). The remaining 11 species are found at lower elevations in habitats poorly represented or entirely absent from protected areas. This includes but is not limited to hanging gardens, low-elevation riparian areas and wetlands, and specific soil types such as gypsum and Mancos Shale soils.

Management activities that could have impacts on sensitive plant species on the SJNF include livestock grazing, recreation, solid mineral development (mining), oil and gas development, fire management, timber harvest, and mechanical fuels treatments. Other actions such as road maintenance or noxious

weed management may also have an impact on sensitive plant species. Impacts would depend on many factors, including the extent, timing, frequency, and duration of activities. Impacts to sensitive plant species from management activities would be reduced, minimized, or prevented by the implementation of standards, guidelines, and stipulations in the LRMP, the implementation of project-specific mitigation measures, and following direction in the ESA, BLM Colorado's Standards for Public Land Health (Standards 2, 3 and 4), BLM Colorado's Guidelines for Livestock Grazing Management, BLM Manual 6840 (Special Status Species Management), and BLM Manual 6840.06, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development "The Gold Book" (2007), Integrated Weed Management Plan (BLM 2011). Impacts from the activities listed above are discussed in more detail below.

## 4.3.1 Livestock Grazing

Livestock grazing may have impacts to BLM sensitive plant species that occur in the habitats where grazing may occur. Past livestock grazing has had a significant impact on the current conditions seen in the many of the terrestrial ecosystems on the TRFO, particularly mountain grasslands, semi-desert shrublands, semi-desert grasslands, sagebrush shrublands, and pinyon-juniper woodlands. The sensitive plant species that occur in these lower elevation terrestrial ecosystems are the most likely to be impacted by livestock grazing. This includes Jones' bluestar, Naturita milkvetch, Schmoll's milkvetch, Comb Wash buckwheat, Lone Mesa snakeweed, frosty bladderpod, Dolores River skeletonplant, aromatic Indian breadroot, and cushion bladderpod. For these species, there is a standard in the LRMP requiring that projects or activities occurring on shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

There has also been a significant reduction in the numbers of cattle and sheep that graze on the TRFO since the early 1900s. In addition, there are also fewer acres available for livestock grazing than there were in the past. The combination of fewer numbers of livestock, fewer acres available for grazing, the use of the guidelines mentioned above, as well as other project-specific design criteria and mitigation measures during project-level planning would help minimize impacts to sensitive species at the project level.

Proposed stocking rates and the amount of area available for permitted livestock grazing varies between alternatives. Alternative D has the potential to impact the highest number of acres and proposes the highest cattle stocking rates, and therefore has the most potential to impact sensitive plant species. Alternative B has the next highest potential to impact sensitive plant species, followed by Alternatives A then C due to incrementally lower numbers of permitted cattle and fewer acres considered suitable for grazing.

## 4.3.2 Recreation

Recreation impacts to BLM sensitive plant species are possible from activities such as camping, hiking, mountain biking, horseback riding, and motorized recreation. Recreation use is widespread and would occur to some extent in all of the terrestrial ecosystems on the TRFO. The species most likely to be impacted by recreation activities include those with known populations near frequently used areas, such as trails, near popular lakes or wetland areas, in areas where cross-country travel is common, and in or near developed recreation sites. The potential for dispersed recreation in many areas makes the potential for impacts to sensitive plant species more likely. The species most likely to be impacted by recreation activities include Jones' bluestar, Naturita milkvetch, Schmoll's milkvetch, Gypsum Valley cateye, Comb Wash buckwheat, and aromatic Indian breadroot. There are standards in the LRMP requiring that projects or activities occurring in fens, wetlands, and hanging gardens occupied by sensitive plant species and on shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species. Use of these standards, guidelines, and additional referenced guidance during project-level planning would help minimize impacts to sensitive species, but impacts from dispersed recreation are still possible.

While the actual direct impacts from different types of recreation use are similar for all alternatives, the amount of area potentially impacted varies by alternative, primarily because of differences in the number acres that would be designated as suitable for motorized use. Alternative A has the most amount of area designated as suitable for motorized recreation and is the only alternative that allows motorized travel off of designated routes, and therefore has the potential to impact sensitive plant species that may be present in these areas. Alternative D has the second highest amount of area designated as suitable for motorized recreation, followed by Alternative B. Alternative C has the fewest number of acres designated as suitable for motorized recreation and therefore has the potential to impact sensitive plant species on the fewest number of acres.

## 4.3.3 Solid Minerals Development

The most common types of solid mineral development within the planning area include gravel operations. landscape rock, hard rock mining, and uranium mining. Currently on the TRFO, most major solid mineral development activity is restricted to lower-elevation terrestrial ecosystems in the Slick Rock area near Dove Creek. Solid mineral development may have impacts to BLM sensitive plant species that occur in the project areas where mining or rock collecting are most likely to occur. The sensitive plant species most likely to be impacted by solid mineral development are those that are near the areas most likely to experience solid mineral development and include Jones' bluestar, Naturita milkvetch, and aromatic Indian breadroot. For BLM sensitive plant species, there are standards requiring that projects or activities occurring in fens, wetlands, and hanging gardens occupied by sensitive plant species and on shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species. These design criteria can be used in operating plans to help minimize potential impacts to sensitive plant species from solid mineral development. In addition, federal authority over mining activities allows for the setting of terms and conditions in operating plans in order to minimize impacts to public lands. There are also areas that have been withdrawn from leasing or are administratively unavailable for leasing that would not be impacted by solid mineral development. Currently, there are 57,058 acres on the TRFO that have been withdrawn from leasing. The standards in the LRMP and the withdrawal of areas from leasing minimize the impact of solid mineral development on sensitive plant species.

The number of acres available for solid minerals development varies by approximately 10,000 acres between alternatives. Alternative C has the fewest number of acres open to locatable mineral development and the highest number of acres proposed for withdrawal, and thus would have the least amount of potential impact on sensitive plant species. Alternative B has more acres available for mineral development, and fewer acres proposed for withdrawal as compared to Alternative C. Alternatives A and D have the most acres available for locatable mineral development and do not propose the withdrawal of any additional areas from mineral development, and would therefore have the most potential to impact sensitive plant species. The number of acres currently withdrawn from possible solid mineral development is the same for each alternative.

## 4.3.4 Oil and Gas Development

Impacts to BLM sensitive plant species and suitable habitat for these species are possible during oil and gas development. The sensitive plant species most likely to be impacted by oil and gas development are those that occur at lower elevations of the TRFO and include Jones' bluestar, Naturita milkvetch, Schmoll's milkvetch, Gypsum Valley cateye, Kachina daisy, Comb Wash buckwheat, Eastwood's monkeyflower, and aromatic Indian breadroot. In areas **already under lease**, but not yet developed, standard lease terms can be used to move the location of a well or access road prior to development to help prevent or minimize impacts to BLM sensitive plant species and their suitable habitat. The standard in the LRMP requiring that activities in shale and gypsum soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species can also be used to condition the approval of development on existing leases. In **new lease** areas, impacts to BLM sensitive plant species and suitable habitat for these species would be minimized by the application of standard lease terms or prevented by the application of special lease stipulations, depending on alternative. Alternative C offers the highest level of protection to sensitive plant species

because it is the only alternative that allows the application of an NSO stipulation on lands occupied by sensitive species and within a 325-foot buffer around those lands. Alternative B allows for a CSU stipulation to be applied to new leases. Under Alternatives A and D, only standard lease terms can be applied.

Overall, oil and gas development under the No Leasing Alternative would have the least amount of impact on sensitive plant species since impacts would only occur in areas that are already under lease. Areas not currently under lease would not be impacted under the No Leasing Alternative. In regards to Alternatives A through D, Alternative C would have the least amount of impact on sensitive plant species. Alternative C has the highest number of acres that are withdrawn from leasing or are administratively unavailable for leasing (Table T-17), and the special leasing stipulations available under this alternative offer the highest level of resource protection available to sensitive plant species (Table T-18). Alternative B offers the second highest number of acres withdrawn or unavailable for leasing and the second highest level of protection to sensitive plant species from special leasing stipulations. Alternative A offers the third. Alternative D has the fewest number of acres that are withdrawn from leasing or are administratively unavailable for leasing and the lowest level of protection offered by special leasing stipulations.

Table T.17 Acres Available and Administratively Not Available for Leasing by Alternative (BLM Surface and Subsurface Mineral Estate)

	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing Alternative
Federal mineral acres	823,423	823,423	823,423	823,423	823,423
Acres administratively not available for leasing	62,437	62,570	161,637	56,916	823,423
Acres available for leasing	760,987	760,853	661,786	766,507	0

Table T.18: Special Leasing Stipulations Related to Sensitive Plant Species

Stipulation	Alternative A	Alternative B	<b>Alternative C</b>	<b>Alternative D</b>
Colorado BLM State Director's Sensitive Species	SLT	CSU	NSO	SLT
Special botanical areas	CSU	NSO	NSO	CSU
Lands with slopes of 25 to 35% and shale soils	SLT	CSU	NSO	SLT
Lands with gypsum soils SLT CSU NSO SLT				
NSO = No Surface Occupancy; CSU = Controlled Surface Use; SLT = Standard Lease Terms				

# 4.3.5 Fire Management

Management-ignited fires, wildfires, and fire suppression would have impacts to terrestrial ecosystems, sensitive plant species, and soils on the TRFO. Prior to Euro-American settlement, fire played an important role in creating and maintaining the vegetation communities in many terrestrial ecosystems, especially ponderosa pine and warm-dry mixed conifer forests. Fire suppression has contributed to the many changes seen in these ecosystems over the past 100 years. The use of management-ignited fires and the appropriate management of naturally ignited wildfires would help to restore the composition and structure of ecosystems and help to maintain or restore the heterogeneous structure and pattern of the vegetation that was present on the TRFO during the reference period, including sensitive plant species. Fire management has the potential to impact all of the sensitive plant species on the TRFO, but none of the habitats in which TRFO sensitive species occur tend to have much active fire management. Project-specific design criteria can be used during project level-planning to help minimize impacts to sensitive plant species at the project level. In addition, there is a standard in the LRMP requiring that projects or activities occurring on shale soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

Up to 10,000 acres of the TRFO could be impacts by fires managed for resource benefit under all alternatives (1,000–2,000 acres per year), so the impacts to sensitive plant species would be the same under each alternative.

## 4.3.6 Timber Harvest and Mechanical Fuels Treatments

Impacts from timber harvest would occur in spruce-fir, aspen, cool-moist mixed conifer, warm-dry mixed conifer, and ponderosa pine forests. Impacts from mechanical fuels treatment are most likely to occur in warm-dry mixed conifer forests, ponderosa pine forests, pinyon-juniper woodlands, and mountain shrublands. These activities may have impacts to sensitive plant species that occur in the habitats where treatments may occur, including Naturita milkvetch, Schmoll's milkvetch, and frosty bladderpod. Project-specific design criteria can be used during project level planning to help minimize impacts to sensitive plant species at the project level. In addition, there is a standard in the LRMP requiring that projects or activities occurring on shale soils occupied by sensitive plant species be designed to maintain the soil characteristics necessary to support and sustain those sensitive plant species.

Timber harvest under Alternative D would impact the vegetation and soils on approximately 3,750 acres of per year, followed by Alternative B at 2,675 acres and Alternative A at 2,650 acres. Alternative C would impact the vegetation and soils on the fewest acres per year (2,165 acres). While Alternatives A, B, and C would impact the vegetation and soils on fewer acres, there would also be less opportunity under these alternatives to use mechanical fuels treatments for ecosystem restoration purposes than under Alternative D.

Mechanical fuels treatments under Alternative D would impact the vegetation and soils on approximately 7,700 acres per year, while Alternatives A, B, and C would each impact approximately 6,700 acres per year. Alternatives A, B, and C would impact the vegetation and soils on fewer acres, but there would be less opportunity under these alternatives to use mechanical fuels treatments for ecosystem restoration purposes than under Alternative D.

## 4.3.7 Cumulative Impacts

Past management activities (including fire management, timber harvest, mechanical fuels treatments, livestock grazing, oil and gas development, solid minerals development, and recreation) on federal and non-federal lands within the planning area caused impacts to sensitive plant species as described above. Many of the impacts associated with those activities (soils disturbances) have recovered due to restoration efforts and natural processes. Many other adverse impacts (particularly those associated with fire management and livestock grazing) are still evident on the TRFO and would remain evident over the next 15 years. Project designs and the proper implementation of mitigation measures, conditions of approval, stipulations, standards, and guidelines served to protect the composition, structure, and function of sensitive plant species on most past projects.

Additional impacts to sensitive plant species (as described above) on federal and non-federal lands within the planning area would occur from the implementation of management activities in the LRMP and from foreseeable future management activities beyond the 15-year life of the LRMP. Those impacts are anticipated to be localized and would not adversely affect the ecological integrity of most areas and would not adversely affect the diversity or viability of sensitive plant species.

The cumulative impact of past, present, and foreseeable future management activities on federal and non-federal lands within the planning area could cause impacts to sensitive plant species, as described above, on a small percent of the planning area. Those impacts would not adversely affect the diversity or viability of sensitive plant species. Project design, the implementation of standards, guidelines, and stipulations in the LRMP, project-level analysis, and the implementation of mitigation measures at the project level would minimize adverse cumulative impacts to sensitive plant species on federal lands.

## 4.3.8 Determination Statement

It is the BLM's determination that implementation of any of the alternatives and activities associated with this FEIS may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing for the BLM Colorado State Director's sensitive plant species known to occur or likely to occur on the TRFO. This includes *Jones' bluestar, Naturita milkvetch, Schmoll's milkvetch, Gypsum Valley cateye, Kachina daisy, Comb Wash buckwheat, Lone* 

Mesa snakeweed, frosty bladderpod, Dolores River skeletonplant, Eastwood's monkeyflower, aromatic Indian breadroot, and Physaria pulvinata.

This determination is based on the fact that project-specific standards, guidelines, and additional referenced guidance can be used during project-level planning to help prevent or minimize impacts to sensitive plant species at the project level. In addition, the application of standards and guidelines in the LRMP related to sensitive plant species and their habitat, the application of standard lease stipulations and special lease stipulations such as NSO and CSU, withdrawal of certain areas from leasing for oil and gas development and/or solid mineral development, and the setting of terms and conditions in operating plans for solid mineral development would all help prevent or minimize impacts to sensitive plant species. Effects to sensitive plant species from management activities could occur under all of the alternatives. Since Alternative D proposes the most active management, it has the greatest potential to affect sensitive plant species as described above, compared to the other alternatives. Alternative A has the next highest potential to affect sensitive plant species since it proposes the second most active management, followed by Alternative B. Alternative C has the least potential to affect sensitive plant species as described above, since it proposes the least active management.

# 5 U.S. FOREST SERVICE FISH BIOLOGICAL EVALUATION AND BUREAU OF LAND MANAGEMENT SENSITIVE FISH SPECIES ANALYSIS

## **5.1 Habitat Associations**

Table T.19 lists the USFS and BLM sensitive fish species evaluated for the SJNF and TRFO.

Table T.19: U.S. Forest Service and Bureau of Land Management Sensitive Species and Habitat Associations for the San Juan National Forest and Tres Rios Field Office

Sensitive Species	Habitat Association or Vegetation Type
Roundtail chub	Tributaries of the Colorado and San Juan rivers
Gila robusta	
Bluehead sucker	Tributaries of the Colorado and San Juan rivers
Catostomus disobolus	
Flannelmouth sucker	Tributaries of the Colorado and San Juan rivers
Catostomus latipinnis	
Colorado River cutthroat trout	Tributaries of the Colorado and San Juan rivers
Oncorhynchus clarki pleuriticus	

# 5.2 Species Evaluation and Effects

## 5.2.1 Roundtail Chub (BLM and USFS Sensitive)

## **Natural History and Background**

#### **Distribution**

The roundtail chub (*Gila robusta*) is an endemic species to the Colorado River Basin in Colorado and Wyoming (Rees, Ptacek, and Miller 2005). Historically, roundtail chubs were known to commonly occur in most medium-sized to large tributaries of the Upper Colorado River Basin (Holden and Stalnaker 1975; Joseph et al. 1977; Vanicek 1967). Roundtail chubs historically occur in lower-elevation streams, including the Colorado, Dolores, Duchesne, Escalante, Green, Gunnison, Price, San Juan, San Rafael, White, and Yampa Rivers (Bezzerides and Bestgen 2002).

The roundtail chub is not restricted to large rivers within the Colorado River Basin. Populations currently exist in western Colorado and south-central Wyoming. Miller and Rees (2000) described historical and recent accounts of roundtail chub in the mainstream of the San Juan River and various tributaries in the southwestern portion of Colorado and in New Mexico. These tributaries include the Animas, Florida, La Plata, and Mancos Rivers, as well as Navajo Wash (tributary of the Mancos River).

The current distribution of roundtail chub on federal lands in Colorado appears to be very limited. However, the planning area contains a documented population of roundtail chubs in the Dolores River, downstream from McPhee Reservoir. Several roundtail chub populations exist in tributary streams immediately downstream of federal lands in Colorado. These tributary streams include Divide and Rifle Creeks (tributaries to the Colorado River), Elkhead Creek (tributary to the Yampa River), and the Florida, La Plata, and Los Pinos Rivers (San Juan River drainage).

## Reason for Concern

Roundtail chubs have been extirpated from 45% of their total historical habitat, especially portions of the Price, San Juan, Gunnison, and Green Rivers (Bezzerides and Bestgen 2002). A decline in populations has been observed in the Animas, Green, Gunnison, Salt, San Juan, White, and Yampa Rivers (Bestgen

and Crist 2000; Lentsch et al. 1998; Miller and Rees 2000; Minckley 1973; Platania 1990; Propst and Hobbes 1999; Wheeler 1997).

The decline in roundtail chub populations can be attributed with the construction of dams and reservoirs between the 1930s and 1960s, introduction of non-native fishes, and removal of water from the Colorado River system (Rees, Ptacek, and Miller 2005). Dams, impoundments, and water use practices (e.g., diversion ditches) are probably the major reasons for modified natural river flows and channel characteristics in the both mainstem rivers and tributary streams. Dams on the mainstem rivers have segmented the river system, blocking spawning migrations and changing flows and temperatures (e.g., conversion of warm water habitat to cold water habitat). Other water use and development projects have reduced or eliminated suitable habitat due to water depletions and reduced stream flows. Major changes in species composition have occurred with the introduction of non-native species. The decline of roundtail chub seems related to predation, competition, or other behavioral interactions with non-native fishes. Alterations in the natural fluvial environment from land management activity has exacerbated this problem (USFWS 1995). To minimize land management effects and proactively assist roundtail chub populations, the BLM and USFS have signed the Range-wide Conservation Agreement and Strategy for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker (Utah Department of Natural Resources 2006).

## Life History

Roundtail chubs evolved in the Colorado River Basin below an elevation of approximately 7,500 feet. Most reaches of this system receive heavy sediment loads and high annual peak flows that contrast with low base flows. Little is known about the specific influence of these annual events, but healthy roundtail chub populations have persisted in habitats with a wide range of annual flows, sediment transport, and even sediment deposition, providing that these physical events are associated with a natural flow regime (Rees, Ptacek, and Miller 2005).

Roundtail chubs live in big rivers and tend to occupy slow-moving waters (Woodling 1985). Murky, rather than clear, water is sought (Sigler and Sigler 1996). Roundtail chubs are often found in stream reaches that have a complexity of pool and riffle habitats (Bezzerides and Bestgen 2000). Juveniles and adults are typically found in relatively deep, low-velocity habitats that are often associated with woody debris or other types of cover (Beyers et al. 2001; Bezzerides and Bestgen 2002; McAda et al. 1980; Miller et al. 1995; Vanicek and Kramer 1969). Sigler and Sigler (1996) reported that substrate in roundtail chub habitat may range from rock and gravel to silt and sand. Temperature tolerance of roundtail chub has been reported up to 39 degrees Celsius, but temperature preference ranges between 22 and 24 degrees Celsius (Weitzel 2002).

The life history phases that appear to be most critical for the roundtail chub include spawning, larvae development, and feeding of the young through the first year of life. In most Colorado River tributaries, natural spawning is initiated on the descending limb of the annual hydrograph as water temperatures approach 18 to 20 degrees Celsius (Bezzerides and Bestgen 2002). Spawning occurs from July 1 to September 1, although high-flow water years may suppress temperatures and extend spawning into September. Conversely, during low-flow years when water warms earlier, spawning may occur in late June (USFWS 1995). Depending on water temperature, eggs usually hatch within 4 to 15 days after spawning.

There is a downstream drift of larvae following hatching (Haines and Tyus 1990). Drifting occurs primarily after mid-July and appears to become more frequent as water temperatures initially increase. From late summer through fall, young of the year roundtail chub prefer natural backwater areas of zero to low velocity.

Very little information is available on the influence of turbidity on the sensitive Colorado River fishes. It is assumed that turbidity is important particularly as it affects the interaction between introduced fishes and the endemic Colorado River fishes. Because these endemic fishes have evolved under natural conditions of high turbidity, it is probable high turbidity is important. Reduction of turbidity may enable introduced species to gain a competitive edge, which could further contribute to the decline of roundtail chub (USFWS 1995).

## **Effects Analysis**

### Direct/Indirect Effects

LRMP revision activities that could potentially influence the roundtail chub include water use and development projects, livestock grazing, road management and construction, oil and gas leasing and development, mining and mine reclamation, and vegetation management projects.

As previously stated, water diversions and depletions have had the greatest effect on roundtail chubs and other warm water sensitive fish species. Water diversions and depletions occur as a result of municipal and domestic uses, water storage, irrigation, stock ponds, transbasin diversions, snowmaking, and numerous other reasons. The effects from water use and development projects (including diversion ditches, storage reservoirs, pipelines, wells, etc.) are reduced or eliminated stream flows, and reduced or eliminated fishery habitat that is not available for use. Water depletions reduce peak flow and durations. This causes losses of backwater pools for spawning and rearing. It also reduces suspended sediments, which may confer a competitive advantage on non-native species. Additional impacts include increased stream temperatures and reduced dissolved oxygen levels. These effects could be more pronounced during periods of natural cyclic flow reductions (in fall and winter) or during summer months in a drought.

The effects from water use and development projects would likely be adverse to roundtail chubs immediately downstream from these projects found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, and San Juan Rivers or their major tributaries (Navajo Wash for the Mancos River) at the lower elevations of the planning area under all alternatives. The impacts of reduced or eliminated fishery habitat would result from water depletions and reduced stream flows. The impacts are not expected to vary between alternatives since the demand for water use authorizations are driven by proponents rather than by the USFS's and BLM's programs or budgets. Because the effects of water use and development projects are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known.

Livestock grazing can degrade in-stream habitat and water quality. Effects generally are increased sedimentation, increased stream temperatures, and fecal/bacteria contamination caused by stream bank trampling, stream widening, and vegetation removal in riparian areas. Use of LRMP standards, guidelines, and additional referenced guidance and referenced documents and manuals should ensure proper rangeland management and minimal effects to fisheries. The effects from livestock grazing and big game use under all alternatives may adversely affect specific individuals but would overall be minor for the populations of the roundtail chub. Because of the lag time to influence existing conditions, Alternative C with its reductions in suitable and available livestock grazing areas may reduce grazing effects on fisheries from the present conditions in the long term but not in the short term. For Alternative D, with its increases in suitable and available livestock grazing areas, grazing may increase effects on these fisheries from the present in the long term but not in the short term. Although there would be localized improvements in grazing management and implementation of rangeland health improvement projects, the impacts of sediment and increased water temperatures on fishery habitat quality should continue.

The effects of roads are primarily through sediment production. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. Heavy sediment loads can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Improperly placed, shaped, and sized culverts can act as fish barriers on key streams or exacerbate erosion and cause head-cutting. Where sediment production is high in areas of exposed marine shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

Small amounts of water are used in road construction and reconstruction, road maintenance, and dust abatement. This water would be obtained from federal and/or private sources. Since this water is connected to a federal action, it is considered a depletion from a major river basin and would require coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA. Because of miles of roads, these activities are almost entirely confined to NFS lands. For all alternatives, about 9 acre-feet of water in the San Juan River Basin and 6 acre-feet of water in the Dolores River Basin are used on forest lands over a 15-year period for road construction and reconstruction, road maintenance, and dust abatement, excluding road-related activities with gas well drilling and completion.

Generally, the effects from roads may adversely affect specific individuals but overall would be minor for the populations of roundtail chubs found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, and San Juan Rivers and their tributaries at the lower elevations of the SJNF and TRFO under all alternatives. Projects that implement the LRMP requiring new road construction in the Dolores or Mancos River drainages (including the Navajo Wash drainage) could likely result in adverse effects to the roundtail chub because of the salinity issues and higher sediment production from these sensitive watersheds. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

There are indications that oil and gas resource potential may result in leasing and exploration east of Pagosa Springs (in the San Juan Sag area) on national forest lands, and on the BLM portion (especially in the Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin, and along the Dolores River Canyon) and on the national forest portion (especially in the Glade and McPhee Reservoir areas, and along the Dolores River Canyon) of the Paradox Basin. There are two types of possible gas development (i.e., conventional gas and GSGP gas) within the Paradox Basin. Exploration could include 1-2 wildcat wells per year in the San Juan Sag area. For conventional development in the Paradox Basin, 4-7 exploratory gas wells per year may be developed on BLM lands for the 15 year period, and 5-8 wildcat gas wells per year may be developed on national forest lands for the same period. For the GSGP development within the Paradox Basin, exploratory wells are slowly developed for the first 7 years, then accelerated development occurs. For BLM-administered lands, two to three exploratory gas wells per year are constructed for the first 7 years, then nine to 24 gas wells per year are developed for the next 8 years. For NFS lands, six to eight wildcat wells are constructed for the first 7 years, then 37 to 68 gas wells per year are developed for the next 8 years.

In total, approximately 8 to 12 acres per year may be disturbed from well pads and roads on BLM public lands from oil and gas development activity for the first 7 years. For the next 8 years, about 36 to 96 acres per year may be disturbed. For all oil and gas development on NFS lands, approximately 24 to 32 acres per year may be disturbed from well pads and roads for the first 7 years. For the following eight years, about 148 to 272 acres per year may be disturbed. If paying quantities of gas are discovered in the San Juan Sag and Paradox Basin (for both conventional and GSGP gas development), as many as 263 and 611 production wells are projected for BLM lands and NFS lands, respectively.

The potential impacts to roundtail chubs from oil and gas leasing and development would be mainly related to water depletions and some reduced stream flows. This would, subsequently, reduce fishery habitat available for use, increase sediment production, and result in degraded fishery habitat. Other potential effects include salinity and water contamination from petroleum products, drilling mud, and other contaminants. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives.

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the GSGP and Paradox conventional development (Table T.20). The major river basins affected by the projected development in the Paradox Leasing Analysis Area are the Dolores and San Juan River Basins. GSGP gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acre-feet of water per well in the drilling and completion process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a coalbed methane (CBM) gas well. Paradox conventional gas wells would use 3.3

acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.

Table T.20: Projected Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased GSGP and Paradox Conventional Gas Wells over a Period of 15 Years for National Forest System

and Bureau of Land Management Lands by Alternative

Jurisdiction	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing Alternative
USFS - leased and unleased GSGP and Paradox conventional	5,311	5,032	4,556	5,300	832
BLM - leased and unleased GSGP and Paradox conventional	4,265	3,726	3,593	4,107	2,480
Total	9,576	8,758	8,149	9,407	3,312

It is assumed that all water associated with GSGP and Paradox conventional gas development and production would be purchased and trucked into the project area, as the water would not be obtained from water sources on public land. The sources of this private water are unknown, but would occur within the San Juan and Dolores River Basins. Since this water is connected to a federal action, it is considered a depletion from a major river basin and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA (Tables T.21and T.22; and see Appendix J).

Water can also be depleted during gas field production. For the GSGP and Paradox conventional wells, small quantities of water are produced or pumped from the gas producing formation(s) in order to release the pressure on the gas tied-up in the seam and allow it to flow. In some cases, as wells are drilled and the formation(s) fractured, groundwater may be connected to surface water streams. With the large number of gas wells proposed in the GSGP and Paradox conventional development (see Table T.21 and Table T.22), the amount of produced water removed may reduce some stream flows in stream systems with warm water sensitive fisheries or tributary to downstream sensitive fishery streams. Because of difficulties in quantifying effects on stream flow, water depleted due to gas field production was not estimated for the GSGP and Paradox conventional wells.

Table T.21: Projected Number of Gas Wells and Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased Gothic Shale Gas Play and Paradox Conventional Gas Wells over a Period of 15 Years by Major River Basin for National Forest System and Bureau of Land Management Lands under Alternative A

	Future Leases		Existing Leases			
	Dolores River	San Juan River	<b>Dolores River</b>	San Juan River		
	Basin	Basin	Basin	Basin		
USFS						
Number of wells	562	24	101	not applicable		
Water used (acre-feet)	4,262	216	832	not applicable		
BLM						
Number of wells	229	34	326	25		
Water Used (acre-feet)	1,490	296	2,256	224		
<b>Grand Total of Water Used</b>	5,752	512	3,088	224		
(acre-feet)						

Table T.22: Projected Number of Gas Wells and Water Used in Well Drilling, Fracturing, and Completion (acre-feet) for Leased and Unleased Gothic Shale Gas Play and Paradox Conventional Gas Wells over a Period of 15 Years by Major River Basin for National Forest System and Bureau of Land Management Lands under Alternative C

	Future Leases		Existing Leases			
	<b>Dolores River</b>	San Juan River	Dolores River	San Juan River		
	Basin	Basin	Basin	Basin		
USFS						
Number of wells	460	20	101	not applicable		
Water used (acre-feet)	3,539	185	832	not applicable		
BLM						
Number of wells	147	20	326	25		
Water Used (acre-feet)	928	185	2,256	224		
Grand Total of Water Used (acre-feet)	4,467	370	3,088	224		

Decreased stream flows may impact roundtail chub populations by reducing or eliminating both the extent and quality of suitable habitat by increasing stream temperatures and, subsequently, reducing dissolved oxygen levels. Such impacts may be more pronounced during periods of natural cyclic flow reductions during fall and winter or during summer months during periods of drought. A loss of stream flow can also reduce a stream's ability to transport sediment downstream and result in increased deposition which, in turn, can impact the numbers and diversity of benthic macro invertebrates and ultimately, aquatic habitat.

Clearing of drill pads and roads and their continued use can expose soil to both wind and water erosion. Given the number of well pads and roads projected in the Paradox Leasing Analysis Area, consequential sedimentation of streams and still water bodies has the potential to impact fishery and aquatic resources (Table T.23). These impacts may be more pronounced in the Paradox Basin because of the number of sensitive watersheds with sediment and salinity concerns that may be upstream of roundtail chubs. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. A typical concern with sedimentation is that sediment loads, above background levels, can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Where sediment production is high in areas of exposed marine shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

Table T.23: Projected Surface Disturbance (acres) for Leased and Unleased Gothic Shale Gas Play and Paradox Conventional Gas Well Development over a Period of 15 Years for National Forest System and Bureau of Land Management Lands by Alternative

Jurisdiction	Alternative A	Alternative B	Alternative C	Alternative D	No Leasing Alternative
USFS - leased and unleased GSGP and Paradox conventional	3,570	3,395	2,770	3,555	530
BLM - leased and unleased GSGP and Paradox conventional	3,070	2,688	2,590	2,920	1,780
Total	6,640	6,083	5,360	6,475	2,310

LRMP direction addresses potential aquatic impacts from surface disturbance. Where gas facilities are developed within the Paradox Basin, soil erosion and sediment deposition, and corresponding potential to impact aquatic and riparian habitat would be limited by implementing lease stipulations that require avoidance of sensitive, erosion prone areas, and riparian areas, secondly by using standards and guidelines in the LRMP, and thirdly by the application of BMPs. Some of these BMPs may include, for example, graveling road surfaces to avoid dust and loss of soil to wind erosion, revegetating or covering any soil stockpiles that would remain for extended periods to avoid significant wind and water erosion, installing slope breaks and silt fences on slopes to slow and filter storm water runoff that might carry exposed soils to surface water drainages, timely reclaiming disturbed areas to minimize erosion after construction of facilities, and avoiding locations having highly erosive soils where possible. Non-productive wells would also be immediately reclaimed. The applicable lease stipulations to protect aquatic ecosystems and fish species are listed in Table T.24.

Table T.24: Lease Stipulations that pertain to the Aquatic Ecosystem and Fish Species as Applied by Alternative (See Appendix H Leasing Stipulation for full description of stipulations and where they apply.)

Fisheries	Alt A	Alt B	Alt C	Alt D	
Perennial streams, water bodies, riparian areas, and fens: Prohibit surface	NSO	NSO	NSO	CSU	
occupancy and surface-disturbing activities within a minimum buffer distance of					
325 horizontal feet for all perennial waters.					
<b>Perennial streams, water bodies, riparian areas, and fens:</b> From 325 to 500	CSU	CSU	CSU	SLT	
horizontal feet from the perennial water body, CSU restrictions would apply.					
<b>Reservoirs and lakes:</b> For reservoirs and lakes 1 acre or larger as measured by	NSO	NSO	NSO	CSU	
the high water mark, no surface occupancy would be allowed within 0.25 mile of					
the high water shoreline.					
Colorado River cutthroat trout (sensitive species): Within 0.25 mile of	NSO	NSO	NSO	CSU	
streams occupied by conservation populations of Colorado River cutthroat trout					
or streams that have been identified as reintroduction sites for Colorado River					
cutthroat trout.					
<b>Greenback cutthroat trout (threatened species):</b> Within 0.5 mile of streams	NSO	NSO	NSO	NSO	
occupied by existing populations of greenback cutthroat trout.					
NSO = No Surface Occupancy; CSU = Controlled Surface Use; SLT = Standard Lease Terms					

Another potential impact to fisheries from the projected gas development and production would be the potential for various chemical leaks and spills. This is mitigated through the use of BMPs that apply to well drilling operation maintenance and material handling.

In regard to air quality, the effects on roundtail chubs would be negligible over the life of the LRMP. The air analysis was focused on the entire planning area, not just the Paradox Leasing Analysis Area. It is a modeling effort with many assumptions, including a gas development scenario as depicted in the RFD scenario. The potential impacts of nitrogen loading or sulfur dioxide deposition to lakes, streams, and the aquatic ecosystems and fish species would be a very slow and prolonged process. It would be very difficult to detect any measureable effects on aquatic ecosystems well beyond the life of the LRMP.

The effects of oil and gas leasing and development would range from highest in Alternative A, to Alternatives D, B, and C, in descending order, and could likely be adverse to the roundtail chub downstream from this activity found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, and San Juan Rivers or their tributaries (Navajo Wash for the Mancos River) at the lower elevations of the SJNF and TRFO. The impacts are mainly due to water depletion and reduced stream flows over time and subsequently reduced fishery habitat available for use. Since the effects from oil and gas development are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known. There would be concerns for new oil and gas development in the Dolores or Mancos River watersheds (including the Navajo Wash drainage) with salinity issues, high road densities, or sensitive to disturbance (e.g., degraded fishery habitat). If no new leases were made available, the impacts on the roundtail chub would be as a result of existing leases only.

Mining activities on the SJNF and TRFO may include suction dredging, gravel mining operations, hard rock mining, uranium and vanadium mining, and recreational gold panning. LRMP Chapter 2 displays the potential acreage of disturbance per year from these activities. The impacts to roundtail chubs from mining or mining reclamation would be mainly due to erosion and sediment impacts (e.g., degraded fishery habitat), saline runoff or heavy metal loading of streams (e.g., toxic levels for aquatic species), and/or altered stream channels and associated fishery habitat.

Generally, the effects related to mining and mining reclamation would be similar under all alternatives and may adversely affect specific individuals but would overall be minor for the populations of roundtail chub found in the La Plata, Animas, Florida, Los Pinos, and San Juan Rivers at the lower elevations of the SJNF and TRFO. Specific uranium and vanadium mining projects in the Dolores or Mancos River drainages (including the Navajo Wash drainage) under all alternatives with salinity issues, high road densities, or sensitive to disturbance would likely result in minor adverse effects to the roundtail chub because of populations in other unaffected drainages. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

The effects from vegetation management (timber harvesting, mechanical fuels reduction, rangeland treatments, prescribed burns, etc.) may adversely affect specific individuals but would overall be minor for the population of roundtail chubs. Since all alternatives have generally the same levels of timber harvest, hazardous fuels treatment, etc. (only 1,800 acres separate Alternative D with the greatest levels of harvest and Alternative C with the least amount of vegetation treatment), the effects would be nearly the same for all alternatives. Again, the impacts are driven by sediment and stream temperature influences on fishery habitat quality.

## **Cumulative Impacts**

Roundtail chubs are BLM and USFS sensitive species as a result of past cumulative effects, locally and regionally, including introduction of non-native species. For all alternatives, the primary adverse cumulative effects on this warm water species, found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, and San Juan Rivers and their tributaries (Navajo Wash for the Mancos River) at the lower elevations of the SJNF and TRFO, presently, would occur from activities that lead to additional water depletions and reduced stream flows (i.e., reduced or eliminated fishery habitat that is available for use). Again, these activities would mainly be water use and development projects on or off the SJNF and TRFO, or oil and gas development from current leases and projected new leases on or off the SJNF and TRFO. The demands for water use and development projects are difficult to analysis because they are driven by proponents rather than by USFS's and BLM's programs or budgets. Because of heightened concerns about sediment and salinity inputs and downstream effects on fishery habitat quality, ground-disturbing activities (new road construction, uranium and vanadium mining, etc.) in the Dolores or Mancos river watersheds (including the Navajo Wash drainage) may also adversely affect the roundtail chub. However, since the exact details for these projects and activities in the Dolores or Mancos River watersheds are unknown presently, the impacts continue to be speculative.

Gas development on private and state mineral estate development may add an additional 810 wells to those projected for development on federal mineral estate in the Paradox Leasing Analysis Area. These private and state well numbers equate to 6,540 acre-feet and 166 acre-feet of water used for drilling, fracturing, and completion for the GSGP gas development and Paradox conventional gas development, respectively. For the San Juan Sag (within the San Juan River Basin), existing leases on NFS lands are estimated to have used 7 acre-feet for well drilling and completion. Existing leases for the San Juan Basin CBM and conventional gas wells are estimated to have used 160 and 14 acre-feet of water, respectively, for BLM lands, and 487 and 42 acre-feet of water, respectively, for NFS lands. Private and state mineral estate development may use an additional 722 acre-feet of water for CBM gas wells in the San Juan Basin. The water usage estimates for the above San Juan Basin CBM gas wells (all ownerships) also includes gas production-induced depletions of river and stream flow.

Water is produced in conjunction with the production of CBM gas in the Northern San Juan Basin. Within the Basin in Colorado, there are concerns that the removal of water from the tributary Fruitland – Pictured Cliffs aquifer may result in stream depletions that impact downstream water users and fisheries. These

concerns have prompted four studies spanning 2000 to 2009 which quantify groundwater/surface water impacts and their interactions.

Our RFD scenario for CBM in the Northern San Juan Basin includes 450 wells to be developed at 80-acre spacing on existing leases. On BLM lands for infill CBM development and production, about 103 acrefeet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and river over the next 15 years. On NFS lands, approximately 241 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and rivers over the next 15 years, due to infill CBM development and production. Private and state mineral estate development may use an additional 516 acre-feet of water over the next 15 years for infill CBM development and production.

Future development in the Northern San Juan Basin would occur on existing oil and gas leases, most of which have already been developed. The decision as to whether the existing lease can be developed is a function of project-level decision-making and subject to the rights granted by the associated leases. Consequently, federal lease development in the Northern San Juan Basin is not considered a direct effect of the LRMP decisions, but is considered in cumulative effects analysis.

It is likely there would be cumulative effects from as many as 3,900 new gas wells drilled on or adjacent to the SJNF and TRFO over the next planning period. In addition to an estimated 875 new wells that may be drilled on new leases on federal lands (discussed under Direct/Indirect Effects), there could be as many as 450 new infill gas wells drilled in the Northern San Juan Basin, 800 to 1,000 new wells drilled on the Southern Ute Indian Tribal lands adjacent to the planning area, and 1,600 new wells on previously leased land in the Paradox Basin and Northern San Juan Basin. The RFD projected wells would require new roads, pipelines, and associated disturbance for gas well construction. Consequently, oil and gas development may have large potential to have substantial cumulative effects when compared to all other activities that affect the SJNF and TRFO. The magnitude of new road/pipeline construction and other disturbances would vary only slightly by alternative.

#### Determination

All LRMP revision alternatives, including Alternative A, may adversely impact individuals (roundtail chubs), but would not likely result in a loss of population viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide. The rationale for this determination is as follows:

- Within the planning area, roundtail chubs are found only in the lower Dolores River downstream
  of McPhee Reservoir. Flows in the lower Dolores River are dictated by McPhee Reservoir
  releases per U.S. Bureau of Reclamation operations. While water depleting activities occurring
  upstream of the reservoir on NFS lands may have a minor effect on reservoir storage, they would
  not be significant relative to the major consumptive uses related to McPhee Reservoir operations.
- Although the roundtail chub distribution and abundance have diminished, they still occupy a wide geographic area and range of locations outside the planning area.
- Through the desired conditions, objectives, standards, and guidelines, leasing stipulations, BLM and USFS manuals and handbooks, and BMPs, the effects of BLM and USFS actions to the roundtail chub would be minimized.
- The SJNF and TRFO would continue to work cooperatively with CPW to develop proactive
  management programs to reduce adverse effects to the roundtail chub and other warm water
  sensitive fish species.

# 5.2.2 Flannelmouth Sucker (BLM and USFS Sensitive)

## **Natural History and Background**

### Distribution

The flannelmouth sucker (*Catostomus latipinnis*) is endemic to the Colorado River Basin (Rees, Ptacek, Carr, and Miller 2005). Historically, the flannelmouth sucker was commonly found in most, if not all, medium-sized to large lower-elevation rivers of the Upper Colorado River drainage (upstream of Glen Canyon Dam). It was found in similar habitats of the Lower Colorado River drainage (downstream of Glen Canyon Dam), but in lesser numbers (Joseph et al. 1977). Although this species is typically associated with large rivers, it also occurs in smaller tributaries and occasionally in lakes and reservoirs (Bezzerides and Bestgen 2002).

The flannelmouth sucker is still widely distributed in medium-sized to large streams in the Upper Colorado River Basin, which includes the mainstream of the Colorado River, numerous tributaries that drain a large portion of Colorado, Wyoming, and Utah, and the San Juan River drainage in New Mexico (Holden and Stalnaker 1975). However, in many areas of the upper basin, populations are thought to be decreasing (Sigler and Sigler 1996).

Within Colorado, flannelmouth suckers are currently present in streams and rivers that are not heavily impacted by impoundments or habitat degradation. Flannelmouth suckers have been reported from the San Juan River and the following tributaries that occur in the southern portion of Colorado: Animas, Florida, La Plata, Los Pinos, Mancos, Navajo, and Piedra Rivers, as well as McElmo Creek (Miller and Rees 2000; Miller et al. 1995; Whiteman 2000). Some of these tributaries are located on the SJNF and TRFO. The distribution parallels that of the bluehead suckers and they are often found together; however the flannelmouth sucker is not as common as the bluehead sucker (*Catostomus discobolus*) on NFS and BLM lands. Available data provided by Miller and Rees (2000) suggested that the range of flannelmouth suckers in the Piedra and San Juan Rivers (and possibly other tributaries) included lower reaches in the planning area. The flannelmouth sucker is known to occur on the SJNF and TRFO of the upper San Juan River, Piedra River, Animas River, Dolores River, Disappointment Creek, McElmo Creek, and Yellowjacket Canyon (Japhet, CPW, Senior Aquatic Biologist for the Southwest District, personal communication with Dave Gerhardt, 2006, Nickell, BLM, Wildlife Biologist for TRFO, personal communication with Mike Johnson, 2008). Occurrence on NFS lands of the Piedra River is unlikely, but it is known to occur in the Piedra River downstream of NFS lands.

### Reason for Concern

Flannelmouth sucker populations have declined in abundance and distribution throughout their historic range (Bezzerides and Bestgen 2002; Weitzel 2002). Most of the decline has been attributed to construction of dams and reservoirs, activities that have diverted water or changed the natural regime in both tributary and mainstem streams and rivers, and introduction of non-native fish species (Rees, Ptacek, Carr, and Miller 2005). Dams on the mainstem Colorado River and its main tributaries have segmented the river system, blocking spawning migrations, altered channel geomorphology, and changed flows and temperatures (e.g., conversion of warm water habitat to cold water habitat from hypolimnetic releases below dams). Other water use and development projects (e.g., diversion ditches, etc.) have reduced or eliminated suitable habitat due to water depletions and reduced stream flows. Major changes in species composition have occurred with the introduction of non-native species, especially the flannelmouth sucker. The decline of flannelmouth sucker seems related to predation, competition, hybridization, or other behavioral interactions with non-native fishes.

At present, there is concern regarding the status of flannelmouth sucker in the Colorado River drainage (Rees, Ptacek, Carr, and Miller 2005). Although the specific mechanisms of most threats to this species are poorly understood, the flannelmouth sucker appears to be vulnerable throughout its range in the Upper Colorado River Basin due to the combined impacts of habitat loss, habitat degradation, habitat fragmentation, and interactions with non-native species. Of the three warm water sensitive species found on the SJNF and TRFO, the flannelmouth sucker appears at as great of risk as the bluehead sucker from present water developments, water diversions, or drought effects. To minimize land management effects

and proactively assist flannelmouth sucker populations, the BLM and USFS have signed the Range-wide Conservation Agreement and Strategy for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker (Utah Department of Natural Resources 2006).

## Life History

The flannelmouth sucker is considered a "big river" fish, preferring deeper, high-gradient riffles and clean substrates. Flannelmouth suckers are typically found in slower, warmer rivers of the Colorado River drainage (Deacon and Mize 1997). They usually inhabit the mainstem of moderate to large rivers but are occasionally found in small streams (Rees, Ptacek, Carr, and Miller 2005). This species frequents pools and deep runs but can also be found in the mouths of tributaries, riffles, and backwaters. Flannelmouth suckers are occasionally found in lakes or reservoirs, but they generally react poorly to impounded habitats or habitats influenced by impoundments (Chart and Bergersen 1992; Minckley 1973).

Juvenile and adult flannelmouth suckers utilize most habitats and can be considered a habitat generalist. Juveniles and adults are most often found using run, pool, and eddy habitats (Joseph et al. 1977; McAda 1977; Tyus et al. 1982). This species appears to prefer temperatures around 25 degrees Celsius (Sublette et al. 1990).

Flannelmouth sucker typically spawn in the Upper Colorado River Basin between April and June (McAda 1977; McAda and Wydoski 1985; Snyder and Muth 1990; Tyus and Karp 1990). Otis (1994) reports that spawning occurs at water temperatures ranging from 12 to 15 degrees Celsius and that flannelmouth suckers in the Lower Colorado River Basin spawn 6 to 8 weeks earlier than those in the upper basin. Flannelmouth spawning aggregations have been observed in tributaries of the Lower Colorado River in glides or slow riffles, over medium-coarse gravel substrate (Otis 1994; Weiss 1993).

There is downstream drift of larvae following hatching (Bezzerides and Bestgen 2002). Carter et al. (1986) and Robinson et al. (1998) suggest that larvae have the ability to actively enter and escape the draft. The draft mechanism likely accomplishes population dispersal and location of suitable larval habitat.

Hybridization between flannelmouth suckers and other species is a common occurrence throughout the range of the species. Flannelmouth sucker are known to hybridize with the following species of suckers: mountain (*C. platyrhynchus*), bluehead, desert (*C. clarki*), razorback (*Xyrauchen texanus*), and the introduced white suckers (*C. commersonii*) (Bezzerides and Bestgen 2002). The most common, and perhaps the most detrimental, instance of hybridization occurs with the non-native white sucker. Also introduced white suckers compete with flannelmouth suckers for food resources.

Very little information is available on the influence of turbidity on the sensitive Colorado River fishes. It is assumed that turbidity is important particularly as it affects the interaction between introduced fishes and the endemic Colorado River fishes. Because these endemic fishes have evolved under natural conditions of high turbidity, it is probable high turbidity is important. Reduction of turbidity may enable introduced species to gain a competitive edge, which could further contribute to the decline of flannelmouth sucker (USFWS 1995).

### **Effects Analysis**

#### Direct/Indirect Effects

LRMP revision activities that could potentially influence the flannelmouth sucker include water use and development projects, livestock grazing, road management and construction, oil and gas leasing and development, mining and mine reclamation, and vegetation management projects.

As previously stated, water diversions and depletions have had the greatest effect on flannelmouth suckers and other warm water sensitive fish species. Water diversions and depletions occur as a result of municipal and domestic uses, water storage, irrigation, stock ponds, transbasin diversions, snowmaking, and numerous other reasons. The effects from water use and development projects (including diversion ditches, storage reservoirs, pipelines, wells, etc.) are reduced or eliminated stream flows, and reduced or eliminated fishery habitat that is not available for use. Water depletions reduce peak flow and durations.

This causes losses of backwater pools for spawning and rearing. It also reduces suspended sediments which may confer a competitive advantage on non-native species. Additional impacts include increased stream temperatures and reduced dissolved oxygen levels. These effects could be more pronounced during periods of natural cyclic flow reductions (in fall and winter) or during summer months in a drought.

The effects from water use and development projects would likely be adverse to flannelmouth suckers immediately downstream from these projects found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, Piedra, San Juan, and Navajo Rivers or their major tributaries, as well as McElmo Canyon, Disappointment Creek, and Yellowjacket Canyon at the lower elevations of the SJNF and TRFO under all alternatives. The impacts of reduced or eliminated fishery habitat would result from water depletions and reduced stream flows. The impacts are not expected to vary between alternatives since the demand for water use authorizations are driven by proponents rather than by the USFS's and BLM's programs or budgets. Because the effects of water use and development projects are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known.

Livestock grazing can degrade in-stream habitat and water quality. Effects generally are increased sedimentation, increased stream temperatures, and fecal/bacteria contamination caused by stream bank trampling, stream widening, and vegetation removal in riparian areas. Use of LRMP standards, guidelines, additional referenced guidance, and manuals should ensure proper rangeland management and minimal effects to fisheries. The effects from livestock grazing and big game use under all alternatives may adversely affect specific individuals but would overall be minor for the populations of the flannelmouth sucker. Because of the lag time to influence existing conditions, Alternative C with its reductions in suitable and available livestock grazing areas may reduce grazing effects on fisheries from the present conditions in the long term but not in the short term. For Alternative D with its increases in suitable and available livestock grazing areas, grazing may increase effects on these fisheries from the present in the long term but not in the short term. Although there would be localized improvements in grazing management and implementation of rangeland health improvement projects, the impacts of sediment and increased water temperatures on fishery habitat quality should continue.

The effects of roads are primarily through sediment production. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors, including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. Heavy sediment loads can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Improperly placed, shaped, and sized culverts can act as fish barriers on key streams or exacerbate erosion and cause head-cutting. Where sediment production is high in areas of exposed marine shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

Small amounts of water are used in road construction and reconstruction, road maintenance, and dust abatement. This water would be obtained from federal and/or private sources. Since this water is connected to a federal action, it is considered a depletion from a major river basin, and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA. Because of miles of roads, these activities are almost entirely confined to NFS lands. For all alternatives, about 9 acre-feet of water in the San Juan River Basin and 6 acre-feet of water in the Dolores River Basin are used on NFS lands over a 15-year period for road construction and reconstruction, road maintenance, and dust abatement, excluding road-related activities with gas well drilling and completion.

Generally, the effects from roads may adversely affect specific individuals but overall would be minor for the populations of flannelmouth suckers found in the La Plata, Animas, Florida, Los Pinos, Piedra, San Juan, and Navajo Rivers and their tributaries at the lower elevations of the SJNF and TRFO under all alternatives. Projects that implement the LRMP requiring new road construction in the Dolores or Mancos river drainages, or within the McElmo Creek or Disappointment Creek watersheds could likely result in adverse effects to the flannelmouth sucker because of the salinity issues and higher sediment production

from these sensitive watersheds. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

There are indications that oil and gas resource potential may result in leasing and exploration east of Pagosa Springs (in the San Juan Sag area) on NFS lands, and on the BLM portion (especially in the Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin, and along the Dolores River Canyon) and the NFS portion (especially in the Glade and McPhee Reservoir areas, and along the Dolores River Canyon) of the Paradox Basin. There are two types of possible gas development (i.e., conventional and GSGP gas) within the Paradox Basin. Exploration could include one to two wildcat wells per year in the San Juan Sag area. For conventional development in the Paradox Basin, four to seven exploratory gas wells per year may be developed on BLM lands for the 15-year period, and five to eight wildcat gas wells per year may be developed on NFS lands for the same period. For the GSGP development within the Paradox Basin, exploratory wells are slowly developed for the first 7 years, then accelerated development occurs. For BLM lands, two to three exploratory gas wells per year are constructed for the first 7 years, then nine to 24 gas wells per year are developed for the next 8 years. For NFS lands, six to eight wildcat wells are constructed for the first 7 years, then 37 to 68 gas wells per year are developed for the next 8 years.

In total, approximately 8 to 12 acres per year may be disturbed from well pads and roads on BLM public lands from oil and gas development activity for the first 7 years. For the next 8 years, about 36 to 96 acres per year may be disturbed. For all oil and gas development on NFS lands, approximately 24 to 32 acres per year may be disturbed from well pads and roads for the first 7 years. For the following 8 years, about 148 to 272 acres per year may be disturbed. If paying quantities of gas are discovered in the San Juan Sag and Paradox Basin (for both conventional and GSGP gas development), as many as 263 and 611 production wells are projected for BLM lands and NFS lands, respectively.

The potential impacts to flannelmouth suckers from oil and gas leasing and development would be mainly related to water depletions and some reduced stream flows. This would, subsequently, reduce fishery habitat available for use, increase sediment production, and result in degraded fishery habitat. Other potential effects include salinity and water contamination from petroleum products, drilling mud, and other contaminants. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives.

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the GSGP and Paradox conventional development (see Table T.20 above). The major river basins affected by the projected development in the Paradox Leasing Analysis Area are the Dolores and San Juan River Basins. GSGP gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acrefeet of water per well in the drilling and completion process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a CBM gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.

It is assumed that all water associated with GSGP and Paradox conventional gas development and production would be purchased and trucked into the project area, as the water would not be obtained from water sources on public land. The sources of this private water are unknown, but would occur within the San Juan River Basin and Dolores River Basin. Since this water is connected to a federal action, it is considered a depletion from a major river basin, and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA (see Tables T.21 and T.22 above; and see Appendix J).

Water can also be depleted during gas field production. For the GSGP and Paradox conventional, small quantities of water are produced or pumped from the gas producing formation(s) in order to release the pressure on the gas tied-up in the seam and allow it to flow. In some cases as wells are drilled and the formation(s) fractured, groundwater may be connected to surface water streams. With the large number of gas wells proposed in the GSGP and Paradox conventional development (see Tables T.21 and T.22

above), the amount of produced water removed may reduce some stream flows in stream systems with warm water sensitive fisheries or tributary to downstream sensitive fishery streams. Because of difficulties in quantifying effects on stream flow, water depleted due to gas field production was not estimated for GSGP and Paradox conventional wells.

Decreased stream flows may impact flannelmouth sucker populations by reducing or eliminating both the extent and quality of suitable habitat by increasing stream temperatures and, subsequently, reducing dissolved oxygen levels. Such impacts may be more pronounced during periods of natural cyclic flow reductions during fall and winter or during summer months during periods of drought. A loss of stream flow can also reduce a stream's ability to transport sediment downstream and result in increased deposition which, in turn, can impact the numbers and diversity of benthic macro invertebrates and ultimately, aquatic habitat.

Clearing of drill pads and roads and their continued use can expose soil to both wind and water erosion. Given the number of well pads and roads projected in the Paradox Leasing Analysis Area, consequential sedimentation of streams and still water bodies has the potential to impact fishery and aquatic resources (see Table T.23 above). These impacts may be more pronounced in the Paradox Basin because of the number of sensitive watersheds with sediment and salinity concerns that may be upstream of flannelmouth suckers. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. A typical concern with sedimentation is that sediment loads, above background levels, can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Where sediment production is high in areas of exposed marine shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

LRMP direction addresses potential aquatic impacts from surface disturbance. Where gas facilities are developed within the Paradox Basin, soil erosion and sediment deposition, and corresponding potential to impact aquatic and riparian habitat, would be limited by implementing lease stipulations that require avoidance of sensitive, erosion-prone areas and riparian areas, secondly by using standards and guidelines (see the LRMP), and thirdly by the application of BMPs. Some of these BMPs may include, for example, graveling road surfaces to avoid dust and loss of soil to wind erosion, revegetating or covering any soil stockpiles that would remain for extended periods to avoid significant wind and water erosion, installing slope breaks and silt fences on slopes to slow and filter storm water runoff that might carry exposed soils to surface water drainages, timely reclaiming disturbed areas to minimize erosion after construction of facilities, and avoiding locations having highly erosive soils where possible. Non-productive wells would also be immediately reclaimed. The applicable lease stipulations to protect aquatic ecosystems and fish species are listed in Table T.24.

Another potential impact to fisheries from the projected gas development and production would be the potential for various chemical leaks and spills. This impact is mitigated through the use of BMPs that apply to well drilling operation maintenance and material handling.

In regard to air quality, the effects on flannelmouth suckers would be negligible over the life of the LRMP. The air analysis was focused on the entire planning area, not just the Paradox Leasing Analysis Area. It is a modeling effort with many assumptions, including a gas development scenario as depicted in the RFD scenario. The potential impacts of nitrogen loading or sulfur dioxide deposition to lakes, streams, and the aquatic ecosystems and fish species would be a very slow and prolonged process. It would be very difficult to detect any measureable effects on aquatic ecosystems well beyond the life of the LRMP.

The effects of oil and gas leasing and development would range from highest in Alternative A, to Alternatives D, B, and C, in descending order, and could likely be adverse to the flannelmouth sucker downstream from this activity found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, Piedra, San Juan, and Navajo Rivers or their tributaries, or in McElmo Creek, Disappointment Creek, or

Yellowjacket Canyon at the lower elevations of the SJNF and TRFO. The impacts are mainly due to water depletion and reduced stream flows over time and subsequently reduced fishery habitat available for use. Since the effects from oil and gas development are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known. There would be concerns for new oil and gas development in the Dolores or Mancos River watersheds, or within the McElmo Creek or Disappointment Creek watersheds with salinity issues, high road densities, or sensitivity to disturbance (e.g., degraded fishery habitat). If no new leases were made available, the impacts on the flannelmouth sucker would be as a result of existing lease only.

Mining activities on the SJNF and TRFO may include suction dredging, gravel mining operations, hard rock mining, uranium and vanadium mining, and recreational gold panning. LRMP Chapter 2 displays the potential acreage of disturbance per year from these activities. The impacts to flannelmouth suckers from mining or mining reclamation would be mainly due to erosion and sediment impacts (e.g., degraded fishery habitat), saline runoff or heavy metal loading of streams (e.g., toxic levels for aquatic species), and/or altered stream channels and associated fishery habitat.

Generally, the effects related to mining and mining reclamation would be similar under all alternatives and may adversely affect specific individuals but would overall be minor for the populations of flannelmouth sucker found in the La Plata, Animas, Florida, Los Pinos, Piedra, San Juan, and Navajo Rivers at the lower elevations of the SJNF and TRFO. Specific uranium and vanadium mining projects in the Dolores or Mancos River drainages or within the McElmo Creek or Disappointment Creek watersheds under all alternatives with salinity issues, high road densities, or sensitive to disturbance would likely result in adverse effects to the flannelmouth sucker because of its more tenuous situation, similar to the bluehead sucker. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

The effects from vegetation management (timber harvesting, mechanical fuels reduction, rangeland treatments, prescribed burns, etc.) may adversely affect specific individuals but would overall be minor for the population of flannelmouth suckers. Since all alternatives have generally the same levels of timber harvest, hazardous fuels treatment, etc. (only 1800 acres separate Alternative D with the greatest levels of harvest and Alternative C with the least amount of vegetation treatment), the effects would be nearly the same for all alternatives. Again, the impacts are driven by sediment and stream temperature influences on fishery habitat quality.

### **Cumulative Impacts**

Flannelmouth suckers are BLM and USFS sensitive species as a result of past cumulative effects, locally and regionally, including the introduction of non-native species. For all alternatives, the primary adverse cumulative effects on this warm water species, found in the Dolores, Mancos, La Plata, Animas, Florida, Los Pinos, Piedra, San Juan, and Navajo Rivers and their tributaries, or in McElmo Creek, Disappointment Creek, and Yellowjacket Canyon at the lower elevations of the SJNF and TRFO, presently, would occur from activities that lead to additional water depletions and reduced stream flows (i.e., reduced or eliminated fishery habitat that is available for use). Again, these activities would mainly be water use and development projects on or off the SJNF and TRFO, or oil and gas development from current leases and projected new leases on or off the SJNF and TRFO. The demands for water use and development projects are difficult to analysis because they are driven by proponents rather than by the USFS's and BLM's programs or budgets. Because of heightened concerns about sediment and salinity inputs and downstream effects on fishery habitat quality, ground-disturbing activities (new road construction, uranium and vanadium mining, etc.) in the Dolores or Mancos Rivers watershed or within the McElmo Creek or Disappointment Creek watersheds may also adversely affect the flannelmouth sucker. However, since the exact details for these projects and activities in the Dolores or Mancos River watersheds, or within the McElmo Creek or Disappointment Creek watersheds are unknown presently, the impacts continue to be speculative.

Gas development on private and state mineral estate development may add an additional 810 wells to those projected for development on federal mineral estate in the Paradox Basin. These private and state well numbers equate to 6,540 and 166 acre-feet of water used for drilling, fracturing, and completion for

the GSGP gas development and Paradox conventional gas development, respectively. For the San Juan Sag (within the San Juan River Basin), existing leases on NFS lands are estimated to have used 7 acrefeet for well drilling and completion. Existing leases for the San Juan Basin CBM and conventional gas wells are estimated to have used 160 and 14 acre-feet of water, respectively, for BLM lands, and 487 and 42 acre-feet of water, respectively, for NFS lands. Private and state mineral estate development may use an additional 722 acre-feet of water for CBM gas wells in the San Juan Basin. The water usage estimates for the above San Juan Basin CBM gas wells (all ownerships) also includes gas production-induced depletions of river and stream flow.

Water is produced in conjunction with the production of CBM gas in the Northern San Juan Basin. Within the Basin in Colorado, there are concerns that the removal of water from the tributary Fruitland – Pictured Cliffs aquifer may result in stream depletions that impact downstream water users and fisheries. These concerns have prompted four studies spanning 2000 to 2009 that quantify groundwater/surface water impacts and their interactions.

The RFD scenario for CBM in the Northern San Juan Basin includes 450 wells to be developed at 80-acre spacing on existing leases. On BLM lands for infill CBM development and production, about 103 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and river over the next 15 years. On NFS lands, approximately 241 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and rivers over the next 15 years, due to infill CBM development and production. Private and state mineral estate development may use an additional 516 acre-feet of water over the next 15 years for infill CBM development and production.

Future development in the Northern San Juan Basin would occur on existing oil and gas leases, most of which have already been developed. The decision as to whether the existing lease can be developed is a function of project level decision-making and subject to the rights granted by the associated leases. Consequently, federal lease development in the Northern San Juan Basin is not considered a direct effect of the LRMP decisions, but is considered in cumulative effects analysis.

It is likely there would be cumulative effects from as many as 3,900 new gas wells drilled on or adjacent to the SJNF and TRFO over the next planning period. In addition to an estimated 875 new wells that may be drilled on new leases on federal lands (discussed under Direct/Indirect Effects), there could be as many as 450 new and infill gas wells drilled in the Northern San Juan Basin, 800 to 1,000 new wells drilled on the Southern Ute Indian Tribal lands adjacent to the planning area, and 1,600 new wells on previously leased land in the Paradox Basin and Northern San Juan Basin. The RFD projected wells would require new roads, pipelines, and associated disturbance for gas well construction. Consequently, oil and gas development may have large potential to have substantial cumulative effects when compared to all other activities that affect the SJNF and TRFO. The magnitude of new road/pipeline construction and other disturbances would vary only slightly by alternative.

### **Determination:**

All LRMP revision alternatives, including Alternative A, may adversely impact individuals (flannelmouth suckers), but would not likely result in a loss of population viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide. The rationale for this determination is as follows:

- The planning area is at the periphery of the flannelmouth sucker's range of distribution, and occurrences are expected to be varied and somewhat rare within the planning area. Occurrences on BLM and NFS lands are strongly influence by the distribution and abundance of populations immediately downstream of these lands. The abundance and distribution of these downstream populations are dictated by a variety of non-agency activities and factors, primarily related to consumptive water uses. While BLM and USFS actions may have a minor influence on downstream river flows, they would not be significant relative to the major consumptive water uses known to dictate population viability and species viability range wide.
- Although the flannelmouth sucker distribution and abundance have diminished, they still occupy a
  wide geographic area and range of locations outside the planning area.

- Through the desired conditions, objectives, standards, and guidelines, leasing stipulations, BLM and USFS manuals and handbooks, and BMPs, the effects of BLM and USFS actions to the flannelmouth sucker would be minimized.
- The SJNF and TRFO would continue to work cooperatively with CPW to develop proactive management programs to reduce adverse effects to the flannelmouth sucker and other warm water sensitive fish species.

## 5.2.3 Bluehead Sucker (BLM and USFS Sensitive)

## **Natural History and Background**

#### Distribution

The bluehead sucker is native to the Colorado River Basin and ancient Lake Bonneville in Idaho, Utah, and Wyoming (Ptacek et al. 2005). Historically, bluehead suckers occurred in streams and rivers in the Colorado River Basin (Bezzerides and Bestgen 2002; Joseph et al. 1977), as well as in the drainages of the upper Snake, Weber, and Bear Rivers (Sigler and Miller 1963; Sublette et al. 1990). Within the Colorado River Basin, bluehead suckers are presently found in the Colorado, Dolores, Duchesne, Escalante, Fremont, Green, Gunnison, Price, San Juan, San Rafael, White, and Yampa Rivers and numerous smaller tributaries (Bezzerides and Bestgen 2002; Vanicek et al. 1970).

Bluehead sucker populations are known to exist in several tributary streams immediately downstream of lands managed by the SJNF and TRFO. Miller and Rees (2000) indicated that the bluehead sucker was among the most common fish species collected in tributaries on the San Juan River. While most of these tributaries originate on the SJNF and TRFO, their study area did not extend onto BLM and NFS lands. These tributary streams include the Florida, La Plata, and Los Pinos Rivers. The bluehead sucker is known to occur on SJNF and TRFO of the upper San Juan River, Piedra River, Animas River, Dolores River, Disappointment Creek, McElmo Creek, and Yellowjacket Canyon (Japhet, CPW, Senior Aquatic Biologist for the Southwest District, personal communication with Dave Gerhardt, 2006, Nickell, BLM, Wildlife Biologist for TRFO, personal communication with Mike Johnson, 2008).

### Reason for Concern

Recent work suggests that bluehead sucker populations are declining throughout their historic range (Bezzerides and Bestgen 2002; Weitzel 2002; Wheeler 1997). Currently, they are found in only 45 percent of their historic range in the Upper Colorado River Basin (Bezzerides and Bestgen 2002). The reasons for this decline are mostly due to water diversion and alteration of stream flow regimes in mainstem rivers and tributary streams, changes in water temperature regimes of these streams, degradation of habitat, and interactions with non-native species (Ptacek et al. 2005). Dams, impoundments, and water use practices (e.g., diversion ditches) are probably the major reasons for modified natural river flows and channel characteristics in the both mainstem rivers and tributary streams. Dams on the mainstem rivers have segmented the river system, blocking spawning migrations, and changing flows and temperatures (e.g., conversion of warm water habitat to cold water habitat). Other water use and development projects have reduced or eliminated suitable habitat due to water depletions and reduced stream flows. Major changes in species composition have occurred with the introduction of non-native species. The decline of bluehead sucker seems related to predation, competition, or other behavioral interactions with non-native fishes. Alterations in the natural fluvial environment from land management activity have exacerbated this problem (USFWS 1995). To minimize land management effects and proactively assist bluehead sucker populations, the BLM and USFS have signed the Rangewide Conservation Agreement and Strategy for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker (Utah Department of Natural Resources 2006).

Historically, the bluehead, flannelmouth, and razorback suckers comprised the medium to large size Catostomid population in the Upper Colorado River Basin. Again, distribution and abundance of bluehead suckers have diminished (Bezzerides and Bestgen 2002). The introduced white sucker and channel catfish (*Ictalurus punctatus*) have diets that partially overlap with bluehead sucker and are thus

competitors for food resources. In addition to competing with bluehead suckers, several non-native and native fishes prey on bluehead suckers (Brooks et al. 2000; Ruppert et al. 1993).

## Life History

Although this species sometimes occupies areas of suitable habitat in larger, low-elevation, mainstem streams, it is most commonly collected in small or mid-sized tributaries of the Upper Colorado River Basin (Ptacek et al. 2005). Most reaches of this system receive heavy sediment loads and high annual peak flows that contrast with low base flows. Little is known about the specific influence of these annual events, but healthy bluehead sucker populations have persisted in habitats with a wide range of annual flows, sediment transport, and even sediment deposition, providing that these physical events are associated with a natural flow regime (Ptacek et al. 2005).

Adult bluehead suckers exhibit a strong preference for specific habitat types (Holden and Stalnaker 1975). In-stream distribution is often related to the presence of rocky substrate, which they prefer (Holden 1973). This species has been reported to typically be found in runs or riffles with rock or gravel substrate (Carlson et al. 1979; Holden and Stalnaker 1975; Sublette et al. 1990; Vanicek 1967). Juveniles have been collected from shallow riffles, backwaters, and eddies with silt or gravel substrate (Vanicek 1967).

Although the species generally inhabits streams with cool temperatures, bluehead suckers have been found inhabiting small creeks with water temperatures as high as 28 degrees Celsius (Smith 1966). This species is found in a large variety of river systems ranging from large rivers with discharges of several hundred cubic meters per second to small creeks with less than 0.05 cubic meter per second (Smith 1966).

Bluehead suckers spawn in the spring and early summer (McAda and Wydoski, 1983). Holden (1973) and Andreasen and Barnes (1975) reported spawning activity occurring during June and July in the Upper Colorado River Basin. All ripe fish that were collected by Vanicek (1967) during spawning occurred in pools or slow runs associated with large cobbles or boulders. Spawning occurred when water temperatures ranged from 18.2 to 24.6 degrees Celsius (Maddux and Kepner 1988).

Hybridization between bluehead suckers and other sucker species occurs throughout the range of this species. Bluehead suckers are known to hybridize with the native flannelmouth sucker and mountain sucker, as well as the non-native white sucker (Bezzerides and Bestgen 2002). In natural or minimally altered systems, certain undefined mechanisms (e.g., depth and velocity requirements, habitat selection, spawning timing) likely isolate spawning individuals of bluehead sucker and flannelmouth sucker; however, hybrids of these two species do occur (Hubbs and Hubbs 1947; Hubbs and Miller 1953; Whiteman 2000). The most common instance of hybridization, and perhaps the most detrimental, occurs with the non-native white sucker.

Very little information is available on the influence of turbidity on the sensitive Colorado River fishes. It is assumed that turbidity is important particularly as it affects the interaction between introduced fishes and the endemic Colorado River fishes. Because these endemic fishes have evolved under natural conditions of high turbidity, it is probable high turbidity is important. Reduction of turbidity may enable introduced species to gain a competitive edge, which could further contribute to the decline of bluehead sucker (USFWS 1995).

## **Effects Analysis**

#### Direct/Indirect Effects

LRMP revision activities that could potentially influence the bluehead sucker include water use and development projects, livestock grazing, road management and construction, oil and gas leasing and development, mining and mine reclamation, and vegetation management projects.

As previously stated, water diversions and depletions have had the greatest effect on bluehead suckers and other warm water sensitive fish species. Water diversions and depletions occur as a result of

municipal and domestic uses, water storage, irrigation, stock ponds, transbasin diversions, snowmaking, and numerous other reasons. The effects from water use and development projects (including diversion ditches, storage reservoirs, pipelines, wells, etc.) are reduced or eliminated stream flows and reduced or eliminated fishery habitat that is not available for use. Water depletions reduce peak flow and durations. This causes losses of backwater pools for spawning and rearing. It also reduces suspended sediments, which may confer a competitive advantage on non-native species. Additional impacts include increased stream temperatures and reduced dissolved oxygen levels. These effects could be more pronounced during periods of natural cyclic flow reductions (in fall and winter) or during summer months in a drought.

The effects from water use and development projects would likely be adverse to bluehead suckers immediately downstream from these projects found in the Dolores, La Plata, Animas, Florida, Los Pinos, Piedra, and San Juan Rivers or their major tributaries or in Disappointment Creek, McElmo Creek, and Yellowjacket Canyon at the lower elevations of the SJNF and TRFO under all alternatives. The impacts of reduced or eliminated fishery habitat would result from water depletions and reduced stream flows. The impacts are not expected to vary between alternatives since the demand for water use authorizations are driven by proponents rather than by the USFS's and BLM's programs or budgets. Because the effects of water use and development projects are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known.

Livestock grazing can degrade in-stream habitat and water quality. Effects generally are increased sedimentation, increased stream temperatures, and fecal/bacteria contamination caused by stream bank trampling, stream widening, and vegetation removal in riparian areas. Use of LRMP standards, guidelines, additional referenced guidance, and manuals should ensure proper rangeland management and minimal effects to fisheries. The effects from livestock grazing and big game use under all alternatives may adversely affect specific individuals but would overall be minor for the populations of the bluehead sucker. Because of the lag time to influence existing conditions, Alternative C with its reductions in suitable and available livestock grazing areas may reduce grazing effects on fisheries from the present conditions in the long term but not in the short term. For Alternative D with its increases in suitable and available livestock grazing areas, grazing may increase effects on these fisheries from the present in the long term but not in the short term. Although there would be localized improvements in grazing management and implementation of rangeland health improvement projects, the impacts of sediment and increased water temperatures on fishery habitat quality should continue.

The effects of roads are primarily through sediment production. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors, including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. Heavy sediment loads can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Improperly placed, shaped, and sized culverts can act as fish barriers on key streams or exacerbate erosion and cause head-cutting. Where sediment production is high in areas of exposed marines shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

Small amounts of water are used in road construction and reconstruction, road maintenance, and dust abatement. This water would be obtained from federal and/or private sources. Since this water is connected to a federal action, it is considered a depletion from a major river basin and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA. Because of miles of roads, these activities are almost entirely confined to NFS lands. For all alternatives, about 9 acre-feet of water in the San Juan River Basin and 6 acre-feet of water in the Dolores River Basin are used on NFS lands over a 15-year period for road construction and reconstruction, road maintenance, and dust abatement, excluding road-related activities with gas well drilling and completion.

Generally, the effects from roads may adversely affect specific individuals but overall would be minor for the populations of bluehead suckers found in the La Plata, Animas, Florida, Los Pinos, Piedra, and San

Juan Rivers and their tributaries at the lower elevations of the SJNF and TRFO under all alternatives. Projects that implement the LRMP requiring new road construction in the Dolores River drainage or Disappointment Creek or McElmo Creek watersheds could likely result in adverse effects to the bluehead sucker because of the salinity issues and higher sediment production from these sensitive watersheds. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

There are indications that oil and gas resource potential may result in leasing and exploration east of Pagosa Springs (in the San Juan Sag area) on NFS lands, and on the BLM portion (especially in the Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin, and along the Dolores River Canyon) and the NFS portion (especially in the Glade and McPhee Reservoir areas, and along the Dolores River Canyon) of the Paradox Basin. There are two types of possible gas development (i.e., conventional gas and GSGP) within the Paradox Basin. Exploration could include one to two wildcat wells per year in the San Juan Sag area. For conventional development in the Paradox Basin, four to seven exploratory gas wells per year may be developed on BLM lands for the 15-year period, and five to eight wildcat gas wells per year may be developed on NFS lands for the same period. For the GSGP development within the Paradox Basin, exploratory wells are slowly developed for the first 7 years, then accelerated development occurs. For BLM lands, two to three exploratory gas wells per year are constructed for the first 7 years, then nine to 24 gas wells per year are developed for the next 8 years. For NFS lands, six to eight wildcat wells are constructed for the first 7 years, then 37 to 68 gas wells per year are developed for the next 8 years.

In total, approximately 8 to 12 acres per year may be disturbed from well pads and roads on BLM public lands from oil and gas development activity for the first 7 years. For the next 8 years, about 36 to 96 acres per year may be disturbed. For all oil and gas development on NFS lands, approximately 24 to 32 acres per year may be disturbed from well pads and roads for the first 7 years. For the following 8 years, about 148 to 272 acres per year may be disturbed. If paying quantities of gas are discovered in the San Juan Sag and Paradox Basin (for both conventional and GSGP gas development), as many as 263 and 611 production wells are projected for BLM lands and NFS lands, respectively.

The potential impacts to bluehead suckers from oil and gas leasing and development would be mainly related to water depletions and some reduced stream flows. This would, subsequently, reduce fishery habitat available for use, increase sediment production, and result in degraded fishery habitat. Other potential effects include salinity and water contamination from petroleum products, drilling mud, and other contaminants. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives.

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the GSGP and Paradox conventional development (see Table T.20 above). The major river basins affected by the projected development in the Paradox Leasing Analysis Area are the Dolores and San Juan River Basins. GSGP gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acrefeet of water per well in the drilling and completion process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a CBM gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.

It is assumed that all water associated with GSGP and Paradox conventional gas development and production would be purchased and trucked into the project area, as the water would not be obtained from water sources on public land. The sources of this private water are unknown, but would occur within the San Juan River Basin and Dolores River Basin. Since this water is connected to a federal action, it is considered a depletion from a major river basin, and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA (see Tables T.21 and T.22; and see Appendix J).

Water can also be depleted during gas field production. For the GSGP and Paradox conventional, small quantities of water are produced or pumped from the gas producing formation(s) in order to release the pressure on the gas tied-up in the seam and allow it to flow. In some cases, as wells are drilled and the formation(s) fractured, groundwater may be connected to surface water streams. With the large number of gas wells proposed in the GSGP and Paradox conventional development (see Tables T.21 and T.22 above), the amount of produced water removed may reduce some stream flows in stream systems with warm water sensitive fisheries or tributary to downstream sensitive fishery streams. Because of difficulties in quantifying effects on stream flow, water depleted due to gas field production was not estimated for the GSGP and Paradox conventional wells.

Decreased stream flows may impact bluehead sucker populations by reducing or eliminating both the extent and quality of suitable habitat by increasing stream temperatures and, subsequently, reducing dissolved oxygen levels. Such impacts may be more pronounced during periods of natural cyclic flow reductions during fall and winter or during summer months during periods of drought. A loss of stream flow can also reduce a stream's ability to transport sediment downstream and result in increased deposition which, in turn, can impact the numbers and diversity of benthic macro invertebrates and, ultimately, aquatic habitat.

Clearing of drill pads and roads and their continued use can expose soil to both wind and water erosion. Given the number of well pads and roads projected in the Paradox Leasing Analysis Area, consequential sedimentation of streams and still water bodies has the potential to impact fishery and aquatic resources (see Table T.23 above). These impacts may be more pronounced in the Paradox Basin because of the number of sensitive watersheds with sediment and salinity concerns that may be upstream of bluehead suckers. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. A typical concern with sedimentation is that sediment loads, above background levels, can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation. Where sediment production is high in areas of exposed marine shales, elevated salinity levels, over extended periods of time, may become toxic for aquatic ecosystems and fish species.

LRMP direction addresses potential aquatic impacts from surface disturbance. Where gas facilities are developed within the Paradox Basin, soil erosion and sediment deposition, and corresponding potential to impact aquatic and riparian habitat would be limited by implementing lease stipulations that require avoidance of sensitive, erosion-prone areas and riparian areas, secondly by using standards and guidelines in the LRMP and thirdly by the application of BMPs. Some of these BMPs may include, for example, graveling road surfaces to avoid dust and loss of soil to wind erosion; revegetating or covering any soil stockpiles that would remain for extended periods to avoid significant wind and water erosion; installing slope breaks and silt fences on slopes to slow and filter storm water runoff that might carry exposed soils to surface water drainages; timely reclaiming disturbed areas to minimize erosion after construction of facilities, and avoiding locations having highly erosive soils where possible. Non-productive wells would also be immediately reclaimed. The applicable lease stipulations to protect aquatic ecosystems and fish species are listed in Table T.24 above.

Another potential impact to fisheries from the projected gas development and production would be the potential for various chemical leaks and spills. This impact is mitigated through the use of BMPs that apply to well drilling operation maintenance and material handling.

In regard to air quality, the effects on bluehead suckers would be negligible over the life of the LRMP. The air analysis was focused on the entire planning area, not just the Paradox Leasing Analysis Area. It is a modeling effort with many assumptions, including a gas development scenario as depicted in the RFD scenario. The potential impacts of nitrogen loading or sulfur dioxide deposition to lakes, streams, and the aquatic ecosystems and fish species would be a very slow and prolonged process. It would be very difficult to detect any measureable effects on aquatic ecosystems well beyond the life of the LRMP.

The effects of oil and gas leasing and development would range from highest in Alternative A, to Alternatives D, B, and C, in descending order, and could likely be adverse to the bluehead sucker downstream from this activity found in the Dolores, La Plata, Animas, Florida, Los Pinos, Piedra, and San Juan Rivers or their tributaries or in Disappointment Creek, McElmo Creek, or Yellowjacket Canyon at the lower elevations of the SJNF and TRFO. The impacts are mainly due to water depletion and reduced stream flows over time and subsequently reduced fishery habitat available for use. Since the effects from oil and gas development are speculative, more precise effects cannot be determined until the location, timing, size, and exact design of the projects are known. There would be concerns for new oil and gas development in the Dolores River, Disappointment Creek, or McElmo Creek watersheds with salinity issues, high road densities, or sensitivity to disturbance (e.g., degraded fishery habitat). If no new leases were made available, the impacts on the bluehead sucker would be as a result of existing leases only.

Mining activities on the SJNF and TRFO may include suction dredging, gravel mining operations, hard rock mining, uranium and vanadium mining, and recreational gold panning. LRMP Chapter 2 displays the potential acreage of disturbance per year from these activities. The impacts to bluehead suckers from mining or mining reclamation would be mainly due to erosion and sediment impacts (e.g., degraded fishery habitat), saline runoff or heavy metal loading of streams (e.g., toxic levels for aquatic species), and/or altered stream channels and associated fishery habitat.

Generally, the effects related to mining and mining reclamation would be similar under all alternatives; and may adversely affect specific individuals but would overall be minor for the populations of bluehead sucker found in the La Plata, Animas, Florida, Los Pinos, Piedra, and San Juan Rivers at the lower elevations of the SJNF and TRFO. Specific uranium and vanadium mining projects in the Dolores River, Disappointment Creek, or McElmo Creek watersheds under all alternatives with salinity issues, high road densities, or sensitive to disturbance would likely result in minor adverse effects to the bluehead sucker because of populations in other unaffected drainages. Again, since the exact details for these projects are unknown presently, the impacts continue to be speculative.

The effects from vegetation management (timber harvesting, mechanical fuels reduction, rangeland treatments, prescribed burns, etc.) may adversely affect specific individuals but would overall be minor for the population of bluehead suckers. Since all alternatives have generally the same levels of timber harvest, hazardous fuels treatment, etc. (only 1,800 acres separate Alternative D with the greatest levels of harvest and Alternative C with the least amount of vegetation treatment), the effects would be nearly the same for all alternatives. Again, the impacts are driven by sediment and stream temperature influences on fishery habitat quality.

## Cumulative Impacts

Bluehead suckers are BLM and USFS sensitive species as a result of past cumulative effects, locally and regionally, including introduction of non-native species. For all alternatives, the primary adverse cumulative effects on this warm water species, found in the Dolores, La Plata, Animas, Florida, Los Pinos, Piedra, and San Juan Rivers and their tributaries and in Disappointment Creek, McElmo Creek, and Yellowjacket Canyon at the lower elevations of the SJNF and TRFO, presently, would occur from activities that lead to additional water depletions and reduced stream flows (i.e., reduced or eliminated fishery habitat that is available for use). Again, these activities would mainly be water use and development projects on or off the SJNF and TRFO, or oil and gas development from current leases and projected new leases on or off the SJNF and TRFO. The demands for water use and development projects are difficult to analysis because they are driven by proponents rather than by the USFS's and BLM's programs or budgets. Because of heightened concerns about sediment and salinity inputs and downstream effects on fishery habitat quality, ground-disturbing activities (new road construction, uranium and vanadium mining, etc) in the Dolores River, Disappointment Creek, or McElmo Creek watersheds may also adversely affect the bluehead sucker. However, since the exact details for these projects and activities are unknown presently, the impacts continue to be speculative.

Gas development on private and state mineral estate development may add an additional 810 wells to those projected for development on federal mineral estate in the Paradox Basin. These private and state well numbers equate to 6,540 and 166 acre-feet of water used for drilling, fracturing, and completion for

the GSGP gas development and Paradox conventional gas development, respectively. For the San Juan Sag (within the San Juan River Basin), existing leases on NFS lands are estimated to have used 7 acrefeet for well drilling and completion. Existing leases for the San Juan Basin CBM and conventional gas wells are estimated to have used 160 and 14 acre-feet of water, respectively, for BLM lands, and 487 and 42 acre-feet of water, respectively, for NFS lands. Private and state mineral estate development may use an additional 722 acre-feet of water for CBM gas wells in the San Juan Basin. The water usage estimates for the above San Juan Basin CBM gas wells (all ownerships) also includes gas production-induced depletions of river and stream flow.

Water is produced in conjunction with the production of CBM gas in the Northern San Juan Basin. Within the Basin in Colorado, there are concerns that the removal of water from the tributary Fruitland – Pictured Cliffs aquifer may result in stream depletions that impact downstream water users and fisheries. These concerns have prompted four studies spanning 2000 to 2009, which quantify groundwater/surface water impacts and their interactions.

Our RFD scenario for CBM in the Northern San Juan Basin includes 450 wells to be developed at 80-acre spacing on existing leases. On BLM lands for infill CBM development and production, about 103 acrefeet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and river over the next 15 years. On NFS lands, approximately 241 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and rivers over the next 15 years, due to infill CBM development and production. Private and state mineral estate development may use an additional 516 acre-feet of water over the next 15 years for infill CBM development and production.

Future development in the Northern San Juan Basin would occur on existing oil and gas leases, most of which have already been developed. The decision as to whether the existing lease can be developed is a function of project level decision-making and subject to the rights granted by the associated leases. Consequently, federal lease development in the Northern San Juan Basin is not considered a direct effect of the LRMP decisions, but is considered in cumulative effects analysis.

It is likely there would be cumulative effects from as many as 3,900 new gas wells drilled on or adjacent to the SJNF and TRFO over the next planning period. In addition to an estimated 875 new wells that may be drilled on new leases on federal lands (discussed under Direct/Indirect Effects), there could be as many as 450 new and infill gas wells drilled in the Northern San Juan Basin, 800 to 1,000 new wells drilled on the Southern Ute Indian Tribal lands adjacent to the planning area, and 1,600 new wells on previously leased land in the Paradox Basin and Northern San Juan Basin. The RFD projected wells would require new roads, pipelines, and associated disturbance for gas well construction. Consequently, oil and gas development may have large potential to have substantial cumulative effects when compared to all other activities that affect the SJNF and TRFO. The magnitude of new road/pipeline construction and other disturbances would vary only slightly by alternative.

### **Determination**

All LRMP revision alternatives, including Alternative A, may adversely impact individuals (bluehead suckers), but would not likely result in a loss of population viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide. The rationale for this determination is as follows:

• The planning area is at the periphery of the bluehead sucker's range of distribution, and occurrences are expected to be varied and somewhat rare within the planning area. Occurrences on BLM and NFS lands are strongly influence by the distribution and abundance of populations immediately downstream of these lands. The abundance and distribution of these downstream populations are dictated by a variety of non-agency activities and factors, primarily related to consumptive water uses. While BLM and USFS actions may have a minor influence on downstream river flows, they would not be significant relative to the major consumptive water uses known to dictate population viability and species viability range wide.

- Although the bluehead sucker distribution and abundance have diminished, they still occupy a wide geographic area and range of locations outside the planning area.
- Through the desired conditions, objectives, standards, and guidelines, leasing stipulations, BLM and USFS manuals and handbooks, and BMPs, the effects of BLM and USFS actions to the bluehead sucker would be minimized.
- The SJNF and TRFO would continue to work cooperatively with CPW to develop proactive
  management programs to reduce adverse effects to the bluehead sucker and other warm water
  sensitive fish species.

## 5.2.4 Colorado River Cutthroat Trout (BLM and USFS Sensitive)

## **Natural History and Background**

#### Distribution

The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) is a species native to western Colorado. The Colorado River cutthroat trout historically occupied portions of the Colorado River drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico (Behnke 1992). Its original distribution probably included portions of larger streams, such as the Green (Simon 1935), Yampa, White, Colorado, and San Juan Rivers. Behnke and Zarn (1976) suggested this subspecies was absent from the lower reaches of many large rivers because of summer thermal barriers. Portions of the lower reaches may have been used in winter (Young 1995).

Remaining populations occur mostly in headwater streams and lakes, and in several isolated headwater tributaries of the San Juan River. In southwest Colorado, conservation populations (i.e., a reproducing and recurring population that is managed to preserve the historical genome and/or unique genetic, ecological, and/or behavioral characteristics within specific populations and within geographic units) of the Colorado River cutthroat trout can be found in the San Juan River System (Augustora Creek, Beaver Creek, Himes Creek, Red Creek, Flint Creek, Cutthroat Creek, Headache Creek, North Fork Sand Creek, Falls Creek, East Fork Piedra River, Sand Creek, Cimarrona Creek, East Fork Coldwater Creek, West Fork Coldwater Creek, West Virginia Gulch, East Fork Shearer Creek, North Fork Shearer Creek, West Fork Shearer Creek, Big Bend Creek, Clear Creek, East Fork Hermosa Creek, Shearer Creek, Castle Creek, Engine Creek, Grasshopper Creek, Pasture Creek, Bear Creek, Little Bear Creek, Hermosa Creek No. 2, Deep Creek). Most of these creeks and rivers are located on the SJNF and TRFO. Several tributaries in the Hermosa drainage of the SJNF are managed as a metapopulation for Colorado River cutthroat trout—a collection of localized populations that are geographically distinct, yet are genetically interconnected through natural movement of individual fish between populations.

#### Reason for Concern

The abundance and distribution of Colorado River cutthroat trout have declined so much over the past 100 years that calls have been made for federal listing (Behnke and Zarn 1976; Young 1995). Colorado River cutthroat trout now occupy less than 1% of their historic range (Behnke 1979). In 2001, the Colorado River Cutthroat Trout Conservation Agreement and Strategy was established for the states of Colorado, Utah, and Wyoming to help state and federal agencies and Indian tribes to work collaboratively and cooperatively to implement conservation measures to maintain and increase the species, and to avoid listing as a threatened or endangered species under the ESA (Colorado River Cutthroat Trout Task Force 2001). Efforts have been underway for a number of years to reverse the declines in Colorado River cutthroat trout populations and reclaim pieces of its historic habitat so that the range of occupied cutthroat habitat is increased. However, the declines over time have been so severe that this subspecies of cutthroat has been petitioned for federal listing several years ago. The USFS decided against listing because of no evidence of major declines in the overall distribution or abundance over the last several decades (Durango Herald 2007), and because of restoration efforts by CPW, the USFS, and other groups. These restoration efforts included stream reclamation, barrier planning and design, development of two broodstocks from local pure Colorado River cutthroat trout strains, stocking of barren waters with these pure strains, genetic testing of local populations, etc.

Introductions of non-native salmonids have had the greatest effect on Colorado River cutthroat trout (Young 1995). Stocking of non-natives began before 1900 and has been very widespread. Interactions with other species impact Colorado River cutthroat trout differently. Brook trout (*Salvelinus fontinalis*) dislodge most subspecies of inland cutthroat when in sympatry, especially at lower elevations (Fausch 1989). The mechanism favoring brook trout is poorly understood; however, it is clear higher water temperatures favor brook trout (DeStaso and Rahel 1994). Rainbow trout (*Oncorhynchus mykiss*) and other cutthroat subspecies readily hybridize with Colorado River cutthroat trout and produce fertile offspring. More populations of Colorado River cutthroat trout have probably been lost through hybridization than through any other means (Behnke and Zarn 1976).

A wide variety of land management practices have been suggested to affect populations of Colorado River cutthroat trout. These include livestock grazing, mining activities, road construction, and water diversions (Binns 1977; Jespersen 1981). Although the primary risk factors for this species are biological (non-native species and to some degree disease), roads can further affect Colorado River cutthroat trout populations through creation of barriers to fish movement, degradation of habitat by constraining streams and eliminating riparian vegetation, introduction of sediment, and the provision of access to anglers. Diversions and other water use practices have reduced or eliminated suitable habitat, fragmented streams, and restricted movement between formerly connected Colorado River cutthroat trout populations and created small, isolated populations. Although this subspecies has been regarded as the "canary in the mine" with regard to habitat degradation (Behnke and Benson 1980), it has also persevered in suboptimal habitats (Binns 1977).

## Life History

The diversity of Colorado River cutthroat trout life histories is probably reduced from historic levels (Young 1995). Adfluvial stocks were once common, but have largely been eliminated. Most remaining stocks are fluvial or resident.

Spawning by this subspecies begins after flows have peaked in spring or early summer and ends before runoff subsides (Quinlan 1980; Young 1995). Water temperature may be a cue for spawning. Colorado River cutthroat trout typically spawn in gravel substrate, mean particle size from 3.7 to 30 mm (Young 1995). The best survival rates are found in substrates with mean particle sizes from 13.8 to 15.9 mm or larger (Young et al. 1991). Redds tend to be located where velocity, depth, and bottom configuration induce water flow through the stream substrate (Young 1989). Redds are generally located where the water is between 11 and 18 cm deep and nose velocity is 15 to 35 cm per second (Young 1995).

Emergence generally occurs in late summer depending on elevation and annual climatic variation. Fry summer microhabitats are usually deeper than 3 cm and water velocity is slower than 6 cm per second (Bozek and Rahel 1991). Woody debris, boulders, and rootwads shelter these sites from higher flows.

Colorado River cutthroat trout reach maturity at age 3 and rarely live past age 6 (Young 1995). Growth rates are among the lowest of all salmonids, probably due to the short growing seasons and colder temperatures at the higher elevations to which Colorado River cutthroat trout are currently confined. Lakes and streams with beaver ponds tend to have higher growth rates.

Some studies have shown spawning habitat, riffle water velocity, and cover to be the most important factors in determining trout biomass, with spawning habitat being the most significant (Jesperson 1981). Herger (1993) found most larger cutthroat trout in pools, and that trout density increased with pool depth. Young (1995) found coarse woody debris to be an important factor in determining Colorado River cutthroat trout biomass. He also noted meander habitats were underused, and occupied sites were deeper than average with slower water velocities.

Cutthroat trout, in some streams, do migrate (Jespersen 1981). Adults often move upstream to spawn and then downstream to deeper waters following spawning (Young 1995). Lake populations move in and out of tributaries. It is common to find smaller cutthroat upstream and the larger fish downstream (Jespersen 1981). Cutthroat may move from tributaries to larger river systems to overwinter.

The influence of predatory species on Colorado River cutthroat trout is not known, but dippers, mink, and other predatory birds and mammals do feed on them (Young 1995). The daytime positions of cutthroats are not associated with banks or overhead cover, and they may face a greater risk of predation to focus on daytime foraging.

## **Effects Analysis**

### Direct/Indirect Effects

LRMP revision activities that could potentially influence the Colorado River cutthroat trout include water use and development projects, livestock grazing, road management and construction, oil and gas leasing and development, mining and mine reclamation, vegetation management projects, and fishery, watershed, and riparian area improvement projects.

The effects from water use and development projects (including diversion ditches, storage reservoirs, pipelines, wells, etc.) on Colorado River cutthroat trout immediately downstream from these projects is from reduced or eliminated stream flows and reduced or eliminated fishery habitat that is not available for use. Additional impacts include increased stream temperatures and reduced dissolved oxygen levels. These effects could be more pronounced during periods of natural cyclic flow reductions (in fall and winter) or during summer months in a drought. Also, snowmaking for ski areas that drains water from streams or from water wells that are likely connected by groundwater to streams also reduces winter base flows that are limiting to habitat and populations of this species.

Depending on the location of the water use and development project, the effects on Colorado River cutthroat trout could vary from no impact to an adverse impact immediately downstream of the project under all alternatives. Again, the impacts are predominately due to water depletions and reduced stream flows and the subsequent effects on fishery habitat available for use. The impacts are not expected to vary between alternatives since the demand for water use authorizations are driven by proponents rather than by the USFS's and BLM's programs or budgets.

Livestock grazing can degrade in-stream habitat and water quality. Effects generally are increased sedimentation, increased stream temperatures, and fecal/bacteria contamination caused by stream bank trampling, stream widening, and vegetation removal in riparian areas. Use of LRMP standards, guidelines, additional referenced guidance, and manuals should ensure proper rangeland management and minimal effects to fisheries. The effects from livestock grazing and big game use under all alternatives may adversely affect specific individuals but would overall be minor for the populations of Colorado River cutthroat trout. Because of the lag time to influence existing conditions, Alternative C with its reductions in suitable and available livestock grazing areas may reduce grazing effects on fisheries from the present conditions in the long term but not in the short term. For Alternative D with its increases in suitable and available livestock grazing areas, grazing may increase effects on these fisheries from the present in the long term but not in the short term. Although there would be localized improvements in grazing management and implementation of rangeland health improvement projects, the impacts of sediment and increased water temperatures on fishery habitat quality should continue.

The effects of roads are primarily through sediment production. Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. Heavy sediment loads can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, increase habitat for *Tubifex* worms (an intermediate host for whirling disease), alter channel form and function, and result in other forms of habitat degradation. Improperly placed, shaped, and sized culverts can act as fish barriers on key streams or exacerbate erosion and cause head-cutting. In addition to being potential sediment sources, roads and specifically road crossings create opportunities for stocking of nonnative fish and for introducing diseases such as whirling disease. Roads may be sediment sources and closing them has a beneficial impact on stream. Additionally, closing roads that provide access to Colorado River cutthroat trout streams would reduce fishing pressure and have a positive impact on the

Colorado River cutthroat trout population. Because of the locations of streams with conservation populations, roads under all alternatives may adversely impact individuals but would overall be minor for the population of the Colorado River cutthroat trout.

Small amounts of water are used in road construction and reconstruction, road maintenance, and dust abatement. This water would be obtained from federal and/or private sources. Since this water is connected to a federal action, it is considered a depletion from a major river basin and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA. Because of miles of roads, these activities are almost entirely confined to NFS lands. For all alternatives, about 9 acre-feet of water in the San Juan River Basin and 6 acre-feet of water in the Dolores River Basin are used on NFS lands over a 15-year period for road construction and reconstruction, road maintenance, and dust abatement, excluding road-related activities with gas well drilling and completion.

There are indications that oil and gas resource potential may result in leasing and exploration east of Pagosa Springs (in the San Juan Sag area) on NFS lands, and on the BLM portion (especially in the Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin, and along the Dolores River Canyon) and the NFS portion (especially in the Glade and McPhee Reservoir areas, and along the Dolores River Canyon) of the Paradox Basin. There are two types of possible gas development (i.e., conventional gas and GSGP) within the Paradox Basin. Exploration could include one to two wildcat wells per year in the San Juan Sag area. For conventional development in the Paradox Basin, four to seven exploratory gas wells per year may be developed on BLM lands for the 15-year period, and five to eight wildcat gas wells per year may be developed on NFS lands for the same period. For the GSGP development within the Paradox Basin, exploratory wells are slowly developed for the first 7 years, then accelerated development occurs. For BLM lands, two to three exploratory gas wells per year are constructed for the first 7 years, then nine to 24 gas wells per year are developed for the next 8 years. For NFS lands, six to eight wildcat wells are constructed for the first 7 years, then 37 to 68 gas wells per year are developed for the next 8 years.

In total, approximately 8 to 12 acres per year may be disturbed from well pads and roads on BLM public lands from oil and gas development activity for the first 7 years. For the next 8 years, about 36 to 96 acres per year may be disturbed. For all oil and gas development on NFS lands, approximately 24 to 32 acres per year may be disturbed from well pads and roads for the first 7 years. For the following 8 years, about 148 to 272 acres per year may be disturbed. If paying quantities of gas are discovered in the San Juan Sag and Paradox Basin (for both conventional and GSGP gas development), as many as 263 and 611 production wells are projected for BLM lands and NFS lands, respectively.

The potential impacts to Colorado River cutthroat trout from oil and gas leasing and development would be mainly related to water depletions and some reduced stream flows. This would, subsequently, reduce fishery habitat available for use, increase sediment production, and result in degraded fishery habitat. Other potential effects include salinity and water contamination from petroleum products, drilling mud, and other contaminants. For the San Juan Sag (within the San Juan River Basin), 35 acre-feet of water is projected to be used in well drilling, fracturing, and completion process for unleased mineral estate over the next 15 years for all alternatives.

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the GSGP and Paradox conventional development (see T.20 above). The major river basins affected by the projected development in the Paradox Leasing Analysis Area are the Dolores and San Juan River Basins. GSGP gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acre-feet of water per well in the drilling and completion process. This level of water consumption is six to 11 times the amount of water used to drill and complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a CBM gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.

It is assumed that all water associated with GSGP and Paradox conventional gas development and production would be purchased and trucked into the project area, as the water would not be obtained from water sources on public land. The sources of this private water are unknown, but would occur within the San Juan River Basin and Dolores River Basin. Since this water is connected to a federal action, it is considered a depletion from a major river basin, and would require preparation of a biological assessment and coordination and consultation with the USFWS for threatened and endangered species, under Section 7 of the ESA (see Tables T.21 and T.22; and see Appendix J).

Water can also be depleted during gas field production. For the GSGP and Paradox conventional, small quantities of water are produced or pumped from the gas producing formation(s) in order to release the pressure on the gas tied-up in the seam and allow it to flow. In some cases, as wells are drilled and the formation(s) fractured, groundwater may be connected to surface water streams. With the large number of gas wells proposed in the GSGP and Paradox conventional development (see Tables T.21 and T.22 above), the amount of produced water removed may reduce some stream flows in stream systems with warm water sensitive fisheries or tributary to downstream sensitive fishery streams. Because of difficulties in quantifying effects on stream flow, water depleted due to gas field production was not estimated for the GSGP and Paradox conventional wells.

Decreased stream flows may impact Colorado River cutthroat trout populations by reducing or eliminating both the extent and quality of suitable habitat by increasing stream temperatures and, subsequently, reducing dissolved oxygen levels. Such impacts may be more pronounced during periods of natural cyclic flow reductions during fall and winter or during summer months during periods of drought. A loss of stream flow can also reduce a stream's ability to transport sediment downstream and result in increased deposition which, in turn, can impact the numbers and diversity of benthic macro invertebrates and, ultimately, aquatic habitat.

Clearing of drill pads and roads and their continued use can expose soil to both wind and water erosion. Given the number of well pads and roads projected in the Paradox Leasing Analysis Area, consequential sedimentation of streams and still water bodies has the potential to impact fishery and aquatic resources (see Table T.23above). Eroded material may be delivered to streams as fine sediment and deposited in channels or transported downstream. The actual amount of sediment from these land-disturbing activities that reaches stream channels or still water bodies would be a result of numerous factors including the location of roads, number of road/stream crossings, slope steepness and length, amount of exposed soil, type of vegetation in the area, frequency and intensity of rainfall, soil type, and the implementation and effectiveness of BMPs. A typical concern with sedimentation is that sediment loads, above background levels, can reduce pool depths, bury stream substrates and spawning gravels, adhere to aquatic insects and the gills of fish, alter channel form and function, and result in other forms of habitat degradation.

LRMP direction addresses potential aquatic impacts from surface disturbance. Where gas facilities are developed within the Paradox Basin, soil erosion and sediment deposition, and corresponding potential to impact aquatic and riparian habitat would be limited by implementing lease stipulations that require avoidance of sensitive, erosion-prone areas and riparian areas, secondly by using standards and guidelines in the LRMP and thirdly by the application of BMPs. Some of these BMPs may include, for example, graveling road surfaces to avoid dust and loss of soil to wind erosion; revegetating or covering any soil stockpiles that would remain for extended periods to avoid significant wind and water erosion; installing slope breaks and silt fences on slopes to slow and filter storm water runoff that might carry exposed soils to surface water drainages; timely reclaiming disturbed areas to minimize erosion after construction of facilities, and avoiding locations having highly erosive soils where possible. Non-productive wells would also be immediately reclaimed. The applicable lease stipulations to protect aquatic ecosystems and fish species are listed in Table T.24 above.

Another potential impact to fisheries from the projected gas development and production would be the potential for various chemical leaks and spills. This impact is mitigated through the use of BMPs that apply to well drilling operation maintenance and material handling.

In regard to air quality, the effects on Colorado River cutthroat trout would be negligible over the life of the LRMP. The air analysis was focused on the entire planning area, not just the Paradox Leasing Analysis

Area. It is a modeling effort with many assumptions, including a gas development scenario as depicted in the RFD scenario. The potential impacts of nitrogen loading or sulfur dioxide deposition to lakes, streams, and the aquatic ecosystems and fish species would be a very slow and prolonged process. It would be very difficult to detect any measureable effects on aquatic ecosystems well beyond the life of the LRMP.

The effects of oil and gas leasing and development would range from highest in Alternative A, to Alternative D, B, and C, in descending order. Given the locations of the conservation populations and the lease parcels, the effects on Colorado River cutthroat trout could vary from no impact to minor under all alternatives. The Colorado River cutthroat trout is only found in a stream on the far eastern edge of the Paradox Leasing Analysis Area, outside the GSGP on NFS lands. This species is also found in streams on NFS lands within the San Juan Sag, which has little development and water usage projected for future leases. Leasing stipulations for watershed, soils, steep slopes, riparian areas, wetland, and floodplain concerns and Colorado River cutthroat trout populations and habitat (NSO stipulation for Alternatives A, B, and C, and CSU stipulation for Alternative D) would generally protect the species' habitat and minimize impacts. However, if oil and gas development is proposed in the vicinity of streams or potential habitat occupied with Colorado River cutthroat trout, the impacts could be adverse immediately downstream over time. Again, the impacts are predominately due to water depletions and the subsequent effects from reduced stream flows. If no new leases were made available, there would be no impacts on the Colorado River cutthroat trout because all existing leases would occur downstream of Colorado River cutthroat trout habitat.

Mining activities on the SJNF and TRFO may include suction dredging, gravel mining operations, hard rock mining, uranium and vanadium mining, and recreational gold panning. LRMP Chapter 2 displays the potential acreage of disturbance per year from these activities. The impacts to Colorado River cutthroat trout from mining or mining reclamation would be mainly due to erosion and sediment impacts (i.e., degraded fishery habitat), saline runoff or heavy metal loading of streams (i.e., toxic levels for aquatic species), and/or altered stream channels and associated fishery habitat. Depending on the location of the action, the effects of mining or mining reclamation, which is nearly identical under all alternatives, on Colorado River cutthroat trout could vary from no impact to adversely affecting specific individuals but would overall be minor for the planning area's population.

Timber harvesting within USFS standards has little impact on stream habitats except for the roads and trails necessary to skid logs to landings and to haul logs to mills. Construction and use of the roads exposes soil and may accelerate erosion. If these areas of bare soil are connected to the stream network, sedimentation can occur. Connectivity of disturbed areas can be due to road crossings, rills, gullies, and poorly designed road drainage systems. Fine sediments in streams can reduce spawning habitat and limit macroinvertebrate populations. If sediment enters the stream during incubation, it can smother the eggs. Sediment can also deposit in pools and reduce pool depth and volume. Adult fish may move out of these pools to find more suitable areas.

Beyond the effects of sediment from vegetation management, fisheries and aquatic species can be impacted by a reduction of streamside vegetation. A reduction in streamside vegetation can increase average annual and average daily stream temperature by reducing shade and decrease the recruitment of large woody debris in streams. Overhanging vegetation provides hiding cover for fish and it helps cool stream temperatures. Large woody debris recruitment is important, because it dissipates erosive stream energy, regulates sediment movement downstream, provides nutrients, and creates pools important to aquatic species.

The effects from vegetation management (timber harvesting, mechanical fuels reduction, rangeland treatments, prescribed burns, etc.) may adversely affect specific individuals but would overall be minor for the population of Colorado River cutthroat trout. Since all alternatives have generally the same levels of timber harvest, hazardous fuels treatment, etc. (only 1,800 acres separate Alternative D with the greatest levels of harvest and Alternative C with the least amount of vegetation treatment), the effects would be nearly the same for all alternatives. Again, the impacts are driven by sediment and stream temperature influences on fishery habitat quality.

With a changing climate, the observed temperature record in southwest Colorado shows average annual warming of about 2 degrees Fahrenheit over the last 30 years (Western Water Assessment 2008). Since river runoff on the SJNF and TRFO is primarily driven by snowmelt, the warming climate from 1978 to

2004 has caused the onset of spring snowmelt and river snowmelt runoff to occur 2 to 3 weeks earlier in southwest Colorado (Clow 2007). Changes in the timing and amount of runoff may impact aquatic ecosystems. Coldwater fish species, especially Colorado River cutthroat trout, may be especially vulnerable to increasing stream temperatures and hydrologic changes such as reduced late-season base stream flows (Nydick et al. 2012). Changes in physical hydrology may favor some non-native or invasive aquatic species and may increase the incidence of diseases such as whirling disease, adding stress to this sensitive species.

Over the last 25 years, a variety of fish habitat improvement projects such as stream bank stabilizations, pool-forming structure placements, spawning habitat enhancement, fish barriers, and culvert replacements have been implemented on the SJNF and TRFO. In addition, the SJNF and TRFO has assisted CPW in conserving and reintroducing genetically pure, wild populations of Colorado River cutthroat trout in selected streams, particularly in Hermosa Creek watershed. On occasions and after project-level analysis and public involvement, some desired, non-native fish populations are removed in order to favor establishment of native fish populations, such as the Colorado River cutthroat trout. In these instances, the SJNF, TRFO, and CPW work closely together to achieve all environmental objectives. Because of locations of specific streams with conservation populations or a reintroduction effort, these improvement projects would either have no impact or a beneficial impact to Colorado River cutthroat trout under all alternatives.

Cutthroat trout populations can be susceptible to over-angling. CPW has an artificial lures and catch and release regulation on many Colorado River cutthroat trout streams. Angling mortality is rarely heavy enough to reduce population viability, but it can change the age structure of fish populations. Loss of breeding individuals could lead to increased inbreeding and long-term loss of viability.

Whirling disease occurs in many fish hatcheries throughout Colorado and infected fish have been stocked statewide. Whirling disease is a parasitic, protozoan that attacks the cartilage of young fish. Whirling disease affects rainbow, cutthroat, brook, and to a lesser degree, brown (*Salmo trutta*) trout. Mortality rates for rainbow, cutthroat, and brook trout can exceed 80%. Dramatic declines in rainbow trout populations have been recorded in the Madison River in Montana, and the Colorado and Fryingpan Rivers in Colorado. Research has shown cutthroat trout are as susceptible as rainbows. Infected fish, birds, mammals, boats, fishermen, and other equipment can spread the spores from area to area.

### **Cumulative Impacts**

The Colorado River cutthroat trout is both a USFS and BLM sensitive species as a result of introductions of non-native fish species and past cumulative effects on a local and regional basis. Like the other sensitive species, the primary adverse cumulative effects under all alternatives, presently, would occur from activities on the SJNF and TRFO that lead to further water depletions and reduced stream flows (i.e., reduced or eliminated fishery habitat for use). Depending on the location of ground-disturbing activities, the cumulative effects of sedimentation may be adverse for certain stretches of stream habitat and individual fish. To help avoid federal listing, the SJNF and TRFO would focus the majority of its fishery habitat improvement efforts in the next 10 to 15 years to the recovery of the Colorado River cutthroat trout.

Gas development on private and state mineral estate development may add an additional 810 wells to those projected for development on federal mineral estate in the Paradox Basin. These private and state well numbers equate to 6,540 and 166 acre-feet of water used for drilling, fracturing, and completion for the GSGP gas development and Paradox conventional gas development, respectively. For the San Juan Sag (within the San Juan River Basin), existing leases on NFS lands are estimated to have used 7 acrefeet for well drilling and completion. Existing leases for the San Juan Basin CBM and conventional gas wells are estimated to have used 160 and 14 acre-feet of water, respectively, for BLM lands, and 487 and 42 acre-feet of water, respectively, for NFS lands. Private and state mineral estate development may use an additional 722 acre-feet of water for CBM gas wells in the San Juan Basin. The water usage estimates for the above San Juan Basin CBM gas wells (all ownerships) also includes gas production-induced depletions of river and stream flow.

Water is produced in conjunction with the production of CBM gas in the Northern San Juan Basin. Within the Basin in Colorado, there are concerns that the removal of water from the tributary Fruitland – Pictured Cliffs aquifer may result in stream depletions that impact downstream water users and fisheries. These concerns have prompted four studies spanning 2000 to 2009, which quantify groundwater/surface water impacts and their interactions.

The RFD scenario for CBM in the Northern San Juan Basin includes 450 wells to be developed at 80-acre spacing on existing leases. On BLM lands for infill CBM development and production, about 103 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and river, over the next 15 years. On NFS lands, approximately 241 acre-feet of water would be needed for well drilling and completion and water depletion from intercepted groundwater potentially bound for streams and rivers over the next 15 years, due to infill CBM development and production. Private and state mineral estate development may use an additional 516 acre-feet of water over the next 15 years for infill CBM development and production.

Future development in the Northern San Juan Basin would occur on existing oil and gas leases, most of which have already been developed. The decision as to whether the existing lease can be developed is a function of project-level decision-making and subject to the rights granted by the associated leases. Consequently, federal lease development in the Northern San Juan Basin is not considered a direct effect of the LRMP decisions, but is considered in cumulative effects analysis.

With the exception of some lands in the upper Animas watershed and the northwestern portions of the SJNF and TRFO, there are no water courses that originate on lands of other ownership that flow onto the SJNF and TRFO. Importantly for the Colorado River cutthroat trout, the cumulative effects of activities from private lands, Indian tribal lands, and other jurisdictions that could affect this species are generally downstream from the remaining Colorado River cutthroat populations, their potential habitat, or potential recovery areas. For instance, it is likely there would be cumulative effects from as many as 3,900 new gas wells drilled on or adjacent to the SJNF and TRFO over the next planning period. In addition to an estimated 875 new wells that may be drilled on new leases on federal lands (discussed under Direct/Indirect Effects), there could be as many as 450 new infill gas wells drilled in the Northern San Juan Basin, 800 to 1,000 new wells drilled on the Southern Ute Indian Tribal lands adjacent to the planning area, and 1,600 new wells on previously leased land in the Paradox Basin and Northern San Juan Basin. The RFD projected wells would require new roads, pipelines, and associated disturbance for gas well construction. Consequently, oil and gas development may have large potential to have substantial cumulative effects when compared to all other activities that affect the SJNF and TRFO. The magnitude of new road/pipeline construction and other disturbances would vary only slightly by alternative.

### **Determination**

All LRMP revision alternatives, including Alternative A, may adversely impact individuals (Colorado River cutthroat trout), but would not likely result in a loss of population viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide. The rationale for this determination is as follows:

- Although the Colorado River cutthroat trout distribution and abundance have diminished, they still
  occupy a variety of locations on the SJNF.
- Existing Colorado River cutthroat trout populations are somewhat secluded and located in areas
  where there is little potential for agency actions to occur that could have any negative effects on
  these populations.
- Through the desired conditions, objectives, standards, and guidelines, leasing stipulations, USFS and BLM manuals and handbooks, and BMPs, effects to the Colorado River cutthroat trout would be minimized.
- The SJNF and TRFO would continue to work cooperatively with CPW in conserving and reintroducing genetically pure, wild populations of Colorado River cutthroat trout in selected streams and establishing several metapopulations.
- The SJNF would focus much of its fishery habitat improvement efforts in the next 10 to 15 years to the recovery of Colorado River cutthroat trout.

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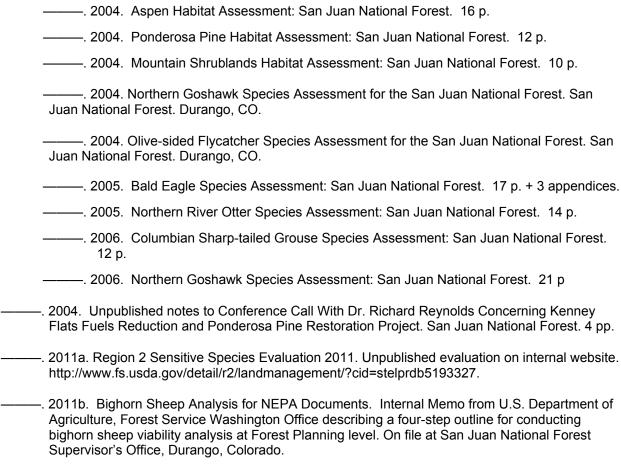
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## **Appendix U**

## **Areas of Critical Environmental Concern**

#### 1. AREAS OF CRITICAL ENVIRONMENTAL CONCERN

#### 1.1. INTRODUCTION

Areas of Critical Environmental Concern (ACECs) are lands where special management attention is needed to prevent irreparable damage to important, unique, and significant historic, cultural, and scenic values; fish or wildlife resources; and natural systems or processes; or to protect life and safety from natural hazards (Bureau of Land Management [BLM] Manual 1613 - .02). The Federal Land Policy and Management Act (FLPMA) directs the BLM to give priority to the identification and potential designation of ACECs through the revision of resource management plans.

# 1.2. AREA OF CRITICAL ENVIRONMENTAL CONCERN ANALYSIS AND DESIGNATION PROCESS

The process and procedural requirements for the designation of ACECs through Resource Management Plan (RMP) revisions is established in BLM planning regulations (43 Code of Federal Regulations [CFR] 1610.7-2), which state that ACEC protection and designation shall be considered throughout the planning process. Specific guidance for ACEC analysis and designation includes the nomination of ACECs; the evaluation of nominated ACECs to determine whether they have values, resources, systems, or processes that meet relevance and importance criteria; the development of management prescriptions for potential ACECs; the determination of whether "special management attention" is required to protect the relevance values, resources, systems, or processes; and the incorporation of potential ACECs into plan alternatives. Lands proposed for ACEC designation must meet the relevance and importance criteria, and they must require "special management attention" to protect their relevance values, resources, systems, or processes.

#### 1.2.1. RELEVANCE AND IMPORTANCE CRITERIA

Nominations for ACECs must be evaluated in order to determine whether they meet the required relevance and importance criteria. A nomination must meet one or more of the relevance and importance criteria in order to be considered as a potential ACEC.

Relevance Criteria: An area meets the relevance criteria if it contains one or more of the following:

- a significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans);
- a fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species, or habitat essential for maintaining species diversity);
- a natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features); and/or
- natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the RMP process that it has become part of a natural process.

For Tres Rios Field Office (TRFO) Land and Resource Management Plan (LRMP) and Final Environmental Impact Statement (FEIS), the evaluation of whether a resource or system meets the relevance criteria for plant, fish, and wildlife species and for plant communities was linked to NatureServe Conservation Status ranks.

NatureServe and its member natural heritage programs have developed a consistent method for evaluating the relative imperilment of both species and ecological communities based on the best available science. These assessments lead to the designation of a conservation status rank. The three

broad categories that factor into these rankings include rarity, trends, and threats. Conservation status rankings include secure (G5), apparently secure (G4), vulnerable (G3), imperiled (G2), critically imperiled (G1), possibly extinct or eliminated (GH), and presumed extinct or eliminated (GX). The Colorado Natural Heritage Program provides a similar statewide conservation status rank (reported as "S" rankings). The BLM has a long history of partnership with NatureServe, and have collaborated on a broad range of projects in such areas as planning, sensitive species inventory and assessments, ecological classification and mapping, and data sharing and technology development.

Nominated ACECs in the TRFO meet the relevance criteria for fish and wildlife resources and for natural systems if they contain plant species, fish species, wildlife species, or plant communities that have a NatureServe Conservation Status rank of G1, G2, S1, or S2, or are federally listed species, proposed or candidate species for federal listing, BLM State Director's sensitive species, or are endemic species to TRFO lands. The conservation concerns and vulnerability of species and plant communities that have a NatureServe Conservation Status rank of G3 or S3 are acknowledged, but because of their relative abundance compared to the other classes of species, G3/S3 or higher ranked species or plant communities do not meet the relevance criteria unless they meet one of the other criteria listed above.

**Importance Criteria:** The value, resource, system, process, or hazard that meets the relevance criteria must have substantial significance to meet the importance criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

- has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource:
- has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change;
- has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA;
- has qualities that warrant highlighting in order to satisfy public or management concerns about safety and public welfare; and/or
- poses a significant threat to human life and safety or to property.

#### 1.2.2. SPECIAL MANAGEMENT ATTENTION

"Special management" refers to management prescriptions expressly developed to protect the relevance values, resources, systems, or processes of ACECs from the potential adverse effects of management actions (BLM Manual 1613). The TRFO developed the following criteria to determine if a potential ACEC requires special management attention:

- Threats from ground-disturbing management activities, including those that increase the
  establishment and spread of invasive plants. ACECs with more management activities
  and more lands affected by those management activities have more potential for
  adverse effects to their relevance values, resources, systems, or processes.
- Potential ACECs with species or plant communities that have a G1 or S1 NatureServe Conservation Status rank are highly vulnerability to disturbance and extinction and need special management attention.
- Potential ACECs with three or more occurrences of species and/or plant communities that meet the relevance criteria (which includes those with a NatureServe Conservation Status rank of G1, G2, S1, or S2)
- Potential ACECs with resources that have a biodiversity rank of B1 (see definition for this ranking under Section 1.3 below) have outstanding biodiversity significance worthy of special management attention.
- Significance of the habitat for species or plant communities that meet the relevance criteria, or significance of the archeology resources. ACECs that contain much of the total known habitat or many of the total documented occurrences of species or plant communities that meet the relevance criteria, and ACECs that contain world-renowned archeology resources and/or lands with very high densities of archeology resources

- need special management attention.
- Potential ACECs that occur in remote locations have few roads within and adjacent to
  them or are associated with steep slopes and/or rugged topography are less likely to be
  disturbed by management actions, so they are less likely to need special management
  attention to protect their relevance values, resources, systems, or processes. ACECs
  that are easily accessible by roads and that have relatively flat and gentle topography
  are more likely to be disturbed by management actions so they are more likely to need
  special management attention to protect their relevance values, resources, systems, or
  processes.
- Potential ACECs that occur in the Dolores River Canyon wilderness study area (WSA), the Dolores River Canyon area, or other special designations receive additional management prescriptions that protect relevance values, including NSO stipulations, so they are less likely to need special management attention.

#### 1.3. SUMMARY OF FINDINGS FOR NOMINATED ACECS

In the Draft LRMP, 22 sites were evaluated by the LRMP interdisciplinary planning team to determine whether they meet the relevance and importance criteria as set forth in BLM Manual 1613 and should be considered for ACEC designation (see Table U.1 and Figure U-1). Eight sites were jointly nominated by the San Juan Citizens Alliance and Center for Native Ecosystems, and 14 were nominated by the LRMP interdisciplinary planning team. Most of the nominated ACECs are associated with potential conservation areas (PCAs) that were developed by the Colorado Natural Heritage Program. A PCA represents the primary area needed to support the long-term survival of a rare species or plant community within it. PCAs were nominated for consideration as ACECs through an assessment conducted for the TRFO by the Nature Conservancy called *San Juan Planning for Biodiversity Model Project Phase 1 and 2* (Kram et al. 2005 and Oliver et al. 2006). Colorado Natural Heritage Program PCA Biodiversity Significance Ranks were used to identify which PCAs had the highest levels of biodiversity significance.

The Colorado Natural Heritage Program has developed a consistent method for evaluating biodiversity significance of PCAs based on the best available science. These assessments lead to the designation of a biodiversity significance rank. The three broad categories that factor into these rankings include size, quality, and landscape integrity. Biodiversity significance rankings include general biodiversity interest (B5), moderate biodiversity significance (B4), high biodiversity significance (B3), very high biodiversity significance (B2), and outstanding biodiversity significance (B1).

BLM Manual 1613, which provides direction for the designation and management of ACECs, states, "All areas which meet the relevance and importance criteria must be identified as potential ACECs and fully considered for designation and management in resource management planning." Of the 22 sites evaluated for the LRMP, 19 sites were found to meet both the relevance and importance criteria, as shown in Table U.1.

Table U.1: Areas Nominated for Area of Critical Environmental Concern Designation

Area	Meets Relevance and Importance Criteria?	Considered in LRMP Alternatives for ACEC Designation?
Anasazi Culture <sup>1</sup>	X	X
Cement Creek	X	
Cinnamon Pass	X	
Coyote Wash	X	
Disappointment Valley	X	
Dry Creek Basin	X	
Dolores River Canyon: Slick Rock to Bedrock	X	
Grassy Hills	X	X
Gypsum Valley <sup>2</sup>	X	X
Horse Range Mesa		
Lake Como	X	

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Area	Meets Relevance and Importance Criteria?	Considered in LRMP Alternatives for ACEC Designation?
McIntyre Canyon	X	
Mesa Verde Entrance	X	
Muleshoe Bench	X	
Northdale	X	
Picayune Gulch		
Silvey's Pocket	X	X
Slick Rock <sup>3</sup>	X	
Snaggletooth	X	
Spring Creek	X	

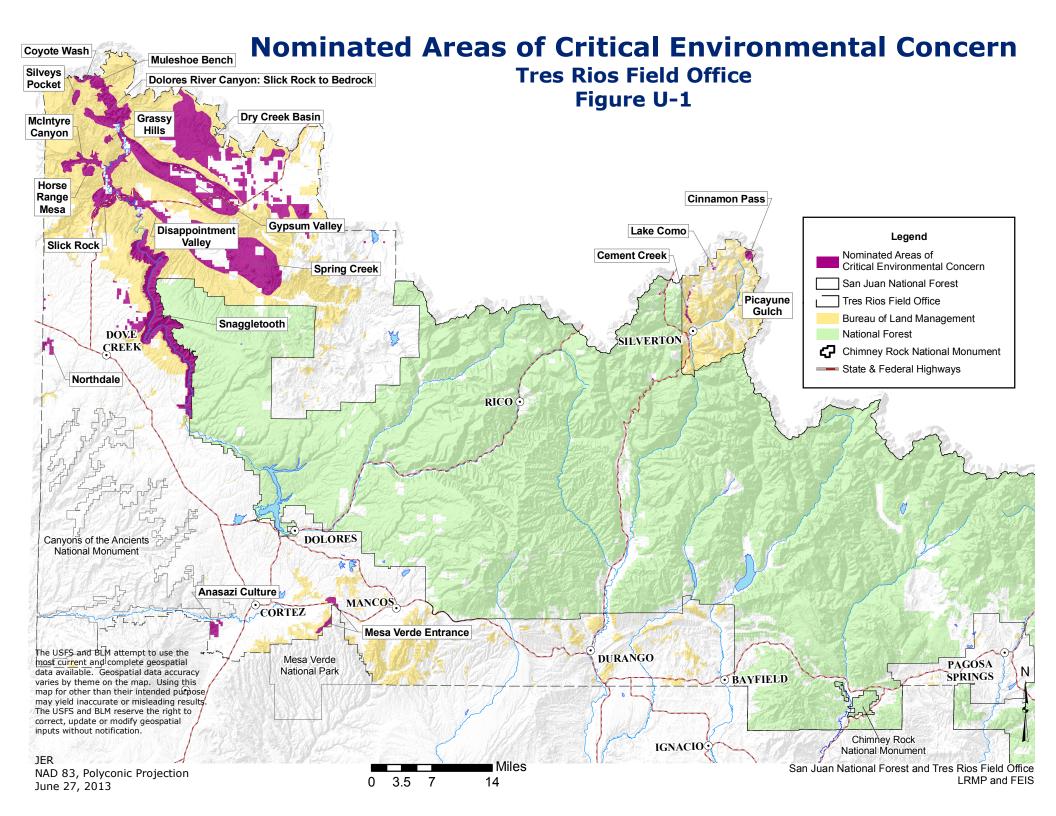
<sup>&</sup>lt;sup>1</sup> Anasazi Culture is the new name for the area identified as Mud Springs in the Draft LRMP/EIS.

Only four proposed ACECs were brought forward in the Draft LRMP alternatives and listed in the *Federal Register* Notice, dated December 14, 2007. In the Proposed LRMP, the Anasazi Culture and Gypsum Valley areas are analyzed for ACEC designation in Alternatives B and C, while Grassy Hills and Silvey's Pocket are only analyzed in Alternative C. The remaining 15 areas that meet both relevance and importance criteria were not included in the alternatives to be analyzed as potential ACECs. To correct this oversight, the BLM will consider these potential ACECs in a future plan amendment.

In the interim, the relevance and importance values identified within these 15 areas are largely protected through specific direction in the LRMP. While not exhaustive, a description of management actions, allocations, oil and gas leasing stipulations and other prescriptions proposed in the LRMP under Alternative B that will provide protection for the relevance and importance criteria in these 15 areas is included with evaluations below. The protective actions listed are principally those that specifically address the relevance and importance values of each nominated area; there are other LRMP management prescriptions that provide additional protection but may not be listed below because of their broad application across the planning area. In addition, protection of identified relevance and importance values will be considered during project-level analysis of any management actions or project proposals.

<sup>&</sup>lt;sup>2</sup> Big Gypsum Valley and Little Gypsum Valley, as identified in the Draft LRMP /EIS, have been combined into one area known as Gypsum Valley.

<sup>&</sup>lt;sup>3</sup> The Slick Rock area also includes the Slick Rock Hill nominated ACEC.



### 1.4. EVALUATIONS OF NOMINATED ACECS

#### Anasazi Culture

Nominator	Existing ACEC; re-nominated by LRMP interdisciplinary planning team
Location	Montezuma County about 1 mile west of Cortez
Description	This ACEC contains BLM lands within the Mud Springs PCA. In 1985, the San Juan/San Miguel RMP designated 156,000 acres of BLM land as the Anasazi Culture Multiple Use Area ACEC due to significant cultural resources. In 2000, President Clinton issued a proclamation designating most of this ACEC as the Canyons of the Ancients National Monument. The Anasazi Culture potential ACEC, which is currently an ACEC under the name Mud Springs/Remnant Anasazi ACEC, contains what is left of the original Anasazi Culture Multiple Use Area ACEC. Existing ACECs are subject to reconsideration as ACECs when resource management plans are revised (BLM Manual 161321A1)
Relevance criteria	This site meets the relevance criteria because it contains significant cultural values in the form of rare and sensitive archeological, religious, and cultural resources important to Native Americans. This site also meets the relevance criteria because it contains S2 ranked short-stem penstemon ( <i>Penstemon breviculus</i> ) and G2 ranked Naturita milkvetch ( <i>Astragalus naturitensis</i> ), which are natural systems in the form of rare (G2 and S2 ranked) terrestrial plant species. Naturita milkvetch is a BLM State Director's sensitive species and therefore qualifies as a relevance value under the natural process or system criteria.
Importance criteria	The rare and sensitive archeological, religious, and cultural resources meet the importance criteria because they have more than locally significant qualities which give them special worth, consequence, meaning, and distinctiveness, and because they have qualities that make them fragile, rare, irreplaceable, unique, and vulnerable to adverse change. Short-stem penstemon and Naturita milkvetch meet the importance criteria because they have more than locally significant qualities due to their rarity (G2 and S2 ranks) which gives them special worth and cause for concern, and because their rarity gives them qualities that make them sensitive, rare, and vulnerable to adverse change. Naturita milkvetch also meets the importance criteria because of its designation on the BLM State Director's sensitive species list which gives it special worth, meaning, distinctiveness, and cause for concern, and which recognizes it as warranting protection in order to carry out the mandates of FLPMA.
Determination	The Anasazi Culture nominated ACEC meets both the relevance and importance criteria so it was identified as a potential ACEC and further analyzed in the planning process. Special management attention is expressly required to protect this potential ACEC and its relevance values and systems because this area has the highest density of Ancestral Puebloan architectural sites on the TRFO, and because it occurs in a location where threats (particularly recreational activities) to its cultural values and rare plants are very likely. The Anasazi Culture nominated ACEC is considered for ACEC designation in Alternatives B and C of the LRMP.

#### Cement Creek

Cement Creek	
Nominator	LRMP interdisciplinary planning team
Location	San Juan County, northwest of the town of Silverton
Description	This nominated ACEC includes all BLM lands within the Cement Creek Iron Fen PCA.
	Colorado's iron fens are unique because their water pH is similar to acid poor fens, while the
	ionic strength of their water is similar to rich fens. Elevation is 10,200 to 11,300 feet and size is
	about 455 acres.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Engelmann spruce/resin
	birch/water sedge/sphagnum (Picea engelmannii/Betula glandulosa/Carex aquatilis/Sphagnum
	angustifolium) woodlands, which is a natural system in the form of a rare and relic terrestrial
	plant community.
Importance	The Engelmann spruce/resin birch/water sedge/sphagnum plant community meets the
criteria	importance criteria because it is has more than locally significant qualities due to its rarity (G2
	rank) and relic status (fens take thousands of years to develop), which gives it special worth,
	distinctiveness, and cause for concern; and this plant community meets the importance criteria

	because its rarity and relic status gives it qualities that make it irreplaceable, unique, and vulnerable to adverse change.
Determination	The Cement Creek nominated ACEC meets both the relevance and importance criteria, but it does not expressly require additional "special management attention" because this potential ACEC and its relevance systems can be adequately protected from management actions and threats by the general LRMP management prescriptions.
Proposed 1	LRMP Direction to Protect Relevance and Importance Values within Cement Creek
Engelmann spruce/ resin birch/ water sedge/ sphagnum Woodlands	<ul> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.</li> <li>2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2 NatureServe plant community conservation status ranks, including wild privet (Forestiera pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis) woodlands, in order to maintain the ecological integrity of those rare plant communities.</li> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.</li> </ul>

#### **Cinnamon Pass**

Chinamon 1 ass			
Nominator	LRMP interdisciplinary planning team		
Location	San Juan County, about 10 air miles northeast of Silverton		
Description	This nominated ACEC contains alpine BLM lands within the Cinnamon Pass PCA. Size is		
	about 562 acres of BLM land and elevation is 12,000 to 13,328 feet.		
Relevance criteria	This site meets the relevance criteria because it contains S1 ranked native sedge (Carex		
	vernacula) herbaceous vegetation which is a natural system in the form of a rare riparian plant		
	community.		
Importance	Native sedge herbaceous vegetation meets the importance criteria because it has more than		
criteria	locally significant qualities due to its rarity (S1 rank) which gives it special worth,		
	distinctiveness, and cause for concern, and this plant community meets the importance criteria		
	because its rarity gives it qualities that make it unique, rare, and vulnerable to adverse change.		
Determination	The Cinnamon Pass nominated ACEC meets both the relevance and importance criteria, but it		
	does not expressly require additional "special management attention" because this potential		
	ACEC and its relevance systems can be adequately protected from management actions and		
	threats by the general LRMP management prescriptions, and because it occurs in a relatively		
	remote location where management actions are unlikely to occur.		
Proposed I	LRMP Direction to Protect Relevance and Importance Values within Cinnamon Pass		
Common to all	NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.		
values	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.		
Native sedge	• 2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in		
herbaceous	riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2		
vegetation	NatureServe plant community conservation status ranks, including wild privet (Forestiera		
	pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis)		
	woodlands, in order to maintain the ecological integrity of those rare plant communities.		

#### **Coyote Wash**

Nominator	LRMP interdisciplinary planning team
Location	Southwest Montrose County, about 9.5 air miles south of Paradox
Description	This nominated ACEC contains BLM lands within the Coyote Wash PCA. Coyote Wash is a steep-sided canyon that joins the Dolores River Canyon between Slick Rock and Bedrock. It is 840 acres of BLM land and occurs at 5,100 to 5,800 feet. This site is in the Dolores River Canyon WSA.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Kachina daisy (Erigeron

	<i>kachinensis</i> ), S1 ranked Eastwood's monkeyflower ( <i>Mimulus eastwoodiae</i> ), and S2 ranked stream orchid ( <i>Epipactis gigantea</i> ), which are natural systems in the form of rare terrestrial plant species. This site also meets the relevance criteria because it contains Kachina daisy and
	Eastwood's monkeyflower and stream orchid, which are natural systems that are on the BLM State Director's sensitive species list. This site also meets the relevance criteria because it
	contains S2 ranked spotted bat ( <i>Euderma maculatum</i> ) (and its habitat), which is a rare (S2 rank) wildlife resource that is on the BLM State Director's sensitive species list. This site also meets
	the relevance criteria because it contains S2 ranked needle-and-thread (Hesperostipa comata)
	Great Basin herbaceous vegetation which is a natural system in the form of a rare terrestrial plant community.
Importance criteria	Kachina daisy, Eastwood's monkeyflower, stream orchid, and spotted bat meet the importance criteria because they have more than locally significant qualities due to their rarity (G2, S1, S2 ranks), which gives them special worth and cause for concern, and these species meet the importance criteria because their rarity gives them qualities that make them sensitive, unique, rare, and vulnerable to adverse change. Kachina daisy, Eastwood's monkeyflower, stream orchid, and spotted bat also meet the importance criteria because they have more than locally significant qualities due to their designation on the BLM State Director's sensitive species list, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Kachina daisy, Eastwood's monkeyflower, stream orchid, and spotted bat also meet the importance criteria because of their designation as high-priority species in the San Juan Biodiversity Model which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Needle-and-thread Great Basin herbaceous vegetation meets the importance criteria
	because it has more than locally significant qualities due to its rarity (S2 rank), which gives it special worth and cause for concern, and this plant community meets the importance criteria because its rarity gives it qualities that make it sensitive, unique, rare, and vulnerable to adverse
Determination	change.  The Coyote Wash nominated ACEC meets both the relevance and importance criteria, but it
	does not expressly require additional "special management attention" because this potential ACEC and its relevance resources and systems can be adequately protected from management actions and threats by the general LRMP management prescriptions, because it occurs in a remote location where management actions are unlikely, because of its topographic inaccessibility, and through its inclusion in the Dolores River Canyon WSA (which includes management prescriptions that protect rare plant and animal species, and rare plant communities including an NSO stipulation).
	LRMP Direction to Protect Relevance and Importance Values within Coyote Wash
Common to all values	<ul> <li>Nominated ACEC is within Dolores River WSA.</li> <li>2.2.73 Agency actions should be designed to avoid or minimize impacts in canyon escarpments, unless the activity is designed to maintain or restore the composition, structure, or function of the terrestrial ecosystems within those escarpments.</li> </ul>
Kachina daisy	2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.
	2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.
	<ul> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	CSU stipulation: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.
Stream orchid	<ul> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.</li> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>

	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.
Eastwood monkeyflower	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.</li> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.</li> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.</li> </ul>
Spotted bat and its habitat	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.</li> <li>2.3.38 Bats: Human access at occupied caves or abandoned mines will be restricted as necessary during the following periods to maintain essential life cycle processes:         <ul> <li>Maternity sites - April 15 through September 1</li> <li>Swarming sites - August 15 through October 15 (30 minutes before sunset to 30 minutes after sunrise)</li> <li>Winter hibernacula - October 15 through May</li> </ul> </li> <li>NSO stipulation: Major river corridors.</li> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.</li> <li>NSO stipulation: Bats.</li> <li>Lease notice: Bats.</li> </ul>
Needle-and- thread Great Basin herbaceous vegetation	3.23.9 Management activities and recreational use should avoid or minimize impacts to rare or unique plant communities.

**Disappointment Valley** 

Nominator	San Juan Citizens Alliance, Center for Native Ecosystems
Location	San Miguel County about 20 miles southwest of Naturita
Description	This nominated ACEC contains BLM lands within the Disappointment Valley Northwest PCA.
	Elevation is 5,600 to 5,800 feet and size is about 2,720 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Gypsum Valley cat-eye
	(Cryptantha gypsophila) and G2 ranked Naturita milkvetch, which are natural systems in the form
	of rare (G2 ranks) terrestrial plant species. It also meets the relevance criteria because Gypsum
	Valley cat-eye and Naturita milkvetch are natural systems that are on the BLM State Director's
	sensitive species list.
Importance	Gypsum Valley cat-eye and Naturita milkvetch meet the importance criteria because they have
criteria	more than locally significant qualities due to their rarity (G2 ranks), which gives them special
	worth and cause for concern, and these species meet the importance criteria because they have
	more than locally significant qualities due to their designation on the BLM State Director's
	sensitive species list, which gives them special worth, meaning, distinctiveness, and cause for
	concern, and which recognizes them as warranting protection in order to carry out the mandates
	of FLPMA. Gypsum Valley cat-eye and Naturita milkvetch also meet the importance criteria
	because of their designation as high-priority species in the San Juan Biodiversity Model, which
	gives them special worth, meaning, distinctiveness, and cause for concern, and which
	recognizes them as warranting protection in order to carry out the mandates of FLPMA.
Determination	The Disappointment Valley nominated ACEC meets both the relevance and importance criteria,
	but it does not expressly require additional "special management attention" because this
	potential ACEC and its relevance systems can be adequately protected from management
	actions and threats by the general LRMP management prescriptions, because ground-disturbing

	management activities will affect a small number of acres, because its biodiversity rank is B2, because the threat from invasive plants is minor, and because the habitat within this ACEC for Gypsum Valley cat-eye and Naturita milkvetch has no special significance.
Proposed LRN	AP Direction to Protect Relevance and Importance Values within Disappointment Valley
Common to all values	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.  CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.
C V 11	CSU: Lands with biological soil crusts.
Gypsum Valley cat-eye	• 2.2.68 Projects or activities that occur in shale and gypsum soils that are occupied by special status plant species must be designed to maintain the soil characteristics necessary to support and sustain those species.
	2.2.77 Management activities in areas with biological soil crusts should be designed to minimize adverse impacts to the soil crusts.
	<ul> <li>2.2.80 Ground disturbance should be limited or otherwise mitigated on gypsum soils and organic soils (histosols) in order to protect the ecological integrity of these rare and unique soils and the rare plants associated with these soils.</li> <li>CSU: Lands with gypsum soils.</li> </ul>
Naturita	See protections common to all values.
milkvetch	

Dolores River Canyon	
Nominator	LRMP interdisciplinary planning team
Location	San Miguel County and southwestern Montrose County between Slick Rock and Bedrock
Description	This nominated ACEC contains BLM lands within the Dolores River Canyon – Slick Rock to
	Bedrock PCA. It includes Dolores River Canyon lands for approximately 50 miles. Most of this area
	is roadless and accessible only by raft, canoe, or kayak. This site is included in the Dolores River
	Canyon area (see Volume II, Section 3.23) and part of it occurs in the Dolores River Canyon WSA.
	Elevation is 4,966 to 6,200 feet and size is 18,083 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G1 ranked wild privet shrublands, which is
	a natural system in the form of a rare terrestrial plant community. This site also meets the relevance
	criteria because it contains G2 ranked Mancos columbine (Aquilegia micrantha) - Eastwood's
	monkeyflower herbaceous vegetation, which is a natural system in the form of a rare terrestrial plant
	community. This site also meets the relevance criteria because it contains G2 ranked Naturita
	milkvetch, and S1 ranked Eastwood's monkeyflower and G2 ranked stream orchid <i>Epipactis</i>
	gigantea),, which are natural systems in the form of rare (G2 and S1 ranks) terrestrial plant species.
	This site also meets the relevance criteria because Naturita milkvetch and Eastwood's monkeyflower
	are natural systems that are on the BLM State Director's sensitive species list. This site also meets
	the relevance criteria because it contains canyon tree frog ( <i>Hyla arenicolor</i> ) and G2 ranked
	peregrine falcon (Falco peregrinus anatum) (and their habitat), which are wildlife resources that are
	on the BLM State Director's sensitive species list. This site also meets the relevance criteria because
	it contains flannel-mouthed sucker (Catostomas latipinnis) (and its habitat), which is a fish resource
	that is on the BLM State Director's sensitive species list, and because the site contains habitat for G2
	ranked roundtail chub (Gila robusta), which is a fish resource that are on the BLM State Director's
	sensitive species list. This site also meets the relevance criteria because it contains S2 ranked Yuma
	skipper (Ochlodes yuma) (and its habitat), which is a rare wildlife resource. This site also meets the
	relevance criteria because of its significant scenic value in the form of diverse and extreme
	topography, and diverse and colorful sedimentary geology.
Importance	The wild privet Shrublands, Mancos columbine - Eastwood's monkeyflower herbaceous vegetation,
criteria	Naturita milkvetch, Eastwood's monkeyflower, stream orchid, Yuma skipper, and peregrine falcon
	meet the importance criteria due to their rarity (G1, G2, S1, S2 ranks), which gives them special
	worth and cause for concern, and these fish and wildlife resources and natural systems meet the
	importance criteria because their rarity gives them qualities that make them sensitive, unique, and
	vulnerable to adverse change. Naturita milkvetch, Eastwood's monkeyflower, canyon tree frog,
	peregrine falcon, and flannelmouth sucker also meet the importance criteria because they have more
	than locally significant qualities due to their designation on the BLM State Director's sensitive

Determination	species list, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Naturita milkvetch, Eastwood's monkeyflower, stream orchid, canyon tree frog, flannelmouth sucker, peregrine falcon, wild privet, and Mancos milkvetch ( <i>Astragalus humillimus</i> ) - Eastwood's monkeyflower herbaceous vegetation also meet the importance criteria because of their designation as high-priority species or plant communities in the San Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. The scenic value also meets the importance criteria because it has more than locally significant qualities due to the large size and extreme depth of the canyon and the diverse colorful geology of the canyon, which gives it special worth and distinctiveness.  The Dolores River Canyon nominated ACEC meets both the relevance and importance criteria, but
	it does not expressly require additional "special management attention" because this potential ACEC and its relevance resources and systems can be adequately protected from management actions and threats by the general LRMP management prescriptions, because it occurs in a remote location where management actions are unlikely, because of its topographic inaccessibility, and through its inclusion in both the Dolores River Canyon area and the Dolores River Canyon WSA that protect rare plant and animal species, rare plant communities, and scenic values.
	MP Direction to Protect Relevance and Importance Values within Dolores River Canyon
Common to all values	<ul> <li>Within Dolores River Canyon Unique Area.</li> <li>2.2.73 Agency actions should be designed to avoid or minimize impacts in canyon escarpments, unless the activity is designed to maintain or restore the composition, structure, or function of the terrestrial ecosystems within those escarpments.</li> <li>NSO: Major river corridors.</li> <li>NSO: Dolores River Canyon.</li> </ul>
Wild privet shrublands	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.</li> <li>2.2.72 Agency actions should avoid or otherwise mitigate long-term adverse impacts in terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant community conservation status ranks in order to maintain the ecological integrity of those rare plant communities.</li> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.</li> <li>2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2 NatureServe plant community conservation status ranks, including wild privet (Forestiera pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis) woodlands, in order to maintain the ecological integrity of those rare plant communities.</li> <li>3.23.9 Management activities and recreational use should avoid or minimize impacts to rare or unique plant communities.</li> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.</li> </ul>
Mancos columbine- Eastwood's monkeyflower herbaceous vegetation	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.</li> <li>2.2.72 Agency actions should avoid or otherwise mitigate long-term adverse impacts in terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant community conservation status ranks in order to maintain the ecological integrity of those rare plant communities.</li> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and</li> </ul>

	hanging gardens from management activities in or adjacent to them (including motorized travel, road construction, water pumping, and peat removal) must not occur.
	• 2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in
	riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2
	NatureServe plant community conservation status ranks, including wild privet shrublands
	and boxelder/river birch woodlands, in order to maintain the ecological integrity of those
	rare plant communities.
	3.23.9 Management activities and recreational use should avoid or minimize impacts to
	rare or unique plant communities.
	<ul> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive</li> </ul>
	plants.
Naturita	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive
milkvetch	plants.
Stream orchid	<ul> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and</li> </ul>
Stream oremu	hanging gardens from management activities in or adjacent to them (including motorized
	travel, road construction, water pumping, and peat removal) must not occur.
	<ul> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
Eastwood's	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are</li> </ul>
monkeyflower	occupied by special status plant species must be designed to maintain the hydrologic
monkcynower	systems necessary to support and sustain those species.
	• 2.2.72 Agency actions should avoid or otherwise mitigate long-term adverse impacts in terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant
	community conservation status ranks in order to maintain the ecological integrity of those
	rare plant communities.
	<ul> <li>2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and</li> </ul>
	hanging gardens from management activities in or adjacent to them (including motorized
	travel, road construction, water pumping, and peat removal) must not occur.
	• 2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2
	NatureServe plant community conservation status ranks, including wild privet ( <i>Forestiera</i>
	pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis)
	woodlands, in order to maintain the ecological integrity of those rare plant communities.
	<ul> <li>3.23.9 Management activities and recreational use should avoid or minimize impacts to</li> </ul>
	rare or unique plant communities.
	<ul> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Ferenmar streams, water bodies, riparian areas, and fens.</li> <li>CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive</li> </ul>
	plants.
Canyon tree frog	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are</li> </ul>
and its habitat	occupied by special status plant species must be designed to maintain the hydrologic
and no month	systems necessary to support and sustain those species.
	<ul> <li>2.3.50 In order to determine site occupation, pre-implementation surveys may be required</li> </ul>
	for projects occurring in habitats that may support populations of sensitive species and
	species listed or proposed under the ESA, as determined by an agency biologist.
	<ul> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
	<ul> <li>CSU: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
Peregrine falcon	<ul> <li>2.3.25 Protection of nests from new structures and human encroachment (see LRMP Table</li> </ul>
and its habitat	2.3.2.) Protection of nests from new structures and number encroachment (see ERWF Table 2.3.2).
and no month	<ul> <li>NSO stipulation: Perennial streams, water bodies, riparian areas, and fens</li> </ul>
	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens
Flannelmouth	
1 Taimennouth	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are

sucker and its	occupied by special status plant species must be designed to maintain the hydrologic
habitat	systems necessary to support and sustain those species.
	NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.
	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.
Roundtail chub	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are
habitat	occupied by special status plant species must be designed to maintain the hydrologic
	systems necessary to support and sustain those species.
	NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.
	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.
Yuma skipper	• 2.3.43 Butterflies: Management actions that could adversely impact occupied habitat used by
and its habitat	special status butterfly species for reproduction must be designed to sustain host plant
	species.
	NSO: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Perennial streams, water bodies, riparian areas, and fens.
Significant scenic	NSO stipulation: High scenic integrity objective and Visual Resource Management (VRM)
value	Class II areas.

## **Dry Creek Basin**Nominator

Nominator	San Juan Citizens Alliance, Center for Native Ecosystems (nominated under name "San Miguel Basin")
Location	San Miguel County, Colorado
Description	This nominated ACEC contains BLM lands within the San Miguel Basin PCA. Elevation is about 5,300 to 6,700 feet. This nominated ACEC contains the Dry Creek Basin subpopulation of the San Miguel population of the Gunnison sage-grouse ( <i>Centrocercus minimus</i> ), which is a species that is restricted to a small area in western Colorado and eastern Utah. Its range has diminished due to the loss, fragmentation, and degradation of sagebrush shrublands caused by agricultural development, mining and energy development, reservoirs, power lines, roads, urban development, and treatments to control sagebrush (including burning, mechanical methods, and herbicides). Livestock overgrazing, the spread of non-native grasses and forbs, and the accelerating increase in the size and extent of wildfires due to the widespread invasion by cheatgrass (Braun 1998) have also affected habitat quality. Management of the San Miguel Basin population of the Gunnison sage-grouse is a cooperative effort with the BLM, Colorado Parks and Wildlife (CPW), State Wildlife Areas, Natural Resources Conservation Service, and private landowners, and management is guided by the Gunnison Sage-grouse Rangewide Conservation Plan.
Relevance criteria	This site meets the relevance criteria because it contains G1 ranked Gunnison sage-grouse (and its habitat), which is a rare (G1 rank) wildlife resource, and this site meets the relevance criteria because the Gunnison sage-grouse is a wildlife resource that is on the BLM State Director's sensitive species list. This site also meets the relevance criteria because it contains G2 ranked Gypsum Valley cat-eye, which is a natural system in the form of a rare (G2 rank) terrestrial plant species. This site also meets the relevance criteria because Gypsum Valley cat-eye is a natural system that is on the BLM State Director's sensitive species list.
Importance criteria	
Determination	The Dry Creek Basin nominated ACEC meets both the relevance and importance criteria
Determination	The Dry Crock Dushi nonlinuced Nelse meets both the relevance and importance criteria

(Gunnison sage-grouse and its habitat). It does not however expressly require additional "special management attention" to protect its relevance and importance values because this potential ACEC and its relevance and importance values can be adequately protected from management actions and threats by the general management prescriptions in the LRMP, and by guidance described in the Gunnison Sage Grouse Rangewide Conservation Plan.

#### Proposed LRMP Direction to Protect Relevance and Importance Values within Dry Creek Basin

#### Gunnison sagegrouse

- 2.3.45 Gunnison sage-grouse: Management activities must not occur from March 1 to June 30 within occupied habitat suitable for nesting to allow for breeding and December 1 to March 15 for known winter habitat.
- 2.3.46 Gunnison sage-grouse: New structural improvements or surface disturbance must not occur within known winter concentration area or within a 0.6-mile radius of known Gunnison sage-grouse leks.
- 2.3.47 Gunnison sage-grouse: In occupied habitat fuels treatments must be designed and implemented with an emphasis on protecting and enhancing existing sagebrush ecosystems
- 2.3.48 Gunnison sage-grouse: Invasive vegetation must be monitored and controlled post-treatment.
- 2.3.70 Structures in sage-grouse habitat should be constructed to limit risk of collision and predation.
- 2.3.71 New noise sources resulting from management activities should not contribute to noise levels that negatively impact sage-grouse leks during the active lek season (March 1 to June 30) based on best available science.
- 2.3.72 Projects in occupied Gunnison sage-grouse habitat should be designed to mitigate or avoid the direct or indirect loss of habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important habitat necessary for sustainable local populations. Projects will incorporate special reclamation measures or design features that accelerate recovery and/or re-establishment of affected sage-grouse habitat as much as possible.
- 2.3.73 Applicable BMPs should be applied to all mineral proposals as Conditions of Approval within occupied sage-grouse habitat to provide for adequate effective habitat and breeding, nesting, and wintering habitat.
- 2.3.74 Remote methodologies for monitoring, transporting fluids to centralized collection tanks, etc., should be utilized to minimize human disturbance in Gunnison sage-grouse habitat.
- 2.3.75 Fuels treatments should be designed to meet strategic protection of identified occupied sage-grouse habitat.
- 2.3.76 Use of native seeds should be used for revegetation following fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet sage-grouse habitat objectives
- 2.3.77 Within occupied Gunnison sage-grouse critical habitat the Rangewide Conservation Plan grazing guidelines should be incorporated when appropriate.
- 2.3.78 Within occupied habitat, grazing in treatment areas should be deferred for 2 growing season after treatment, unless needed for seedbed preparation or desired understory and overstory are established.
- 2.3.79 When developing or modifying water developments, BMPs (see Appendix N) should be used to mitigate potential impacts from West Nile virus on sage-grouse within occupied habitat.
- NSO stipulation: Gunnison sage-grouse occupied critical habitat.
- CSU stipulation: Gunnison sage-grouse occupied critical habitat.
- CSU stipulation: Gunnison sage-grouse proposed unoccupied critical habitat.
- CSU stipulation: Gunnison sage-grouse noise restrictions, occupied and unoccupied critical habitat.

#### Gypsum Valley

• CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive

cat-eye	plants.
	CSU stipulation: Lands with gypsum soils.
	• CSU stipulation: Lands with 25% to 35% slopes and lands with shale soils.

#### **Grassy Hills**

Grassy IIIIs	
Nominator	LRMP interdisciplinary planning team
Location	San Miguel County, Colorado
Description	This nominated ACEC includes all BLM lands within the Grassy Hills PCA. It is located on a
-	sandstone bench southwest of the confluence of Gypsum Creek and the Dolores River.
	Elevation is 6,700 feet and size is 420 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains S2 ranked Needle-and-thread Great
	Basin herbaceous vegetation, which is a natural system in the form of a rare terrestrial plant
	community
Importance	Needle-and-thread Great Basin herbaceous vegetation meets the importance criteria because it
criteria	has more than locally significant qualities due to its rarity (S2 rank), which gives it special
	worth and cause for concern, and this plant community meets the importance criteria because
	its rarity gives it qualities that make it rare and vulnerable to adverse change.
Determination	The Grassy Hills nominated ACEC meets both the relevance and importance criteria, but it may
	not expressly require additional "special management attention" because this potential ACEC
	and its relevance system can be adequately protected from management actions and threats by
	the general LRMP management prescriptions. This potential ACEC is considered for ACEC
	designation in Alternative C.

#### **Gypsum Valley**

Nominator	San Juan Citizens Alliance, Center for Native Ecosystems (nominated as two separate areas: Big Gypsum Valley and Little Gypsum Valley)
Location	San Miguel County about 14 miles southwest of Naturita, Colorado
Description	The Gypsum Valley nominated ACEC includes all BLM lands within the Big and Little Gypsum Valley PCAs. The Big Gypsum Valley and Little Gypsum Valley nominated ACECs were combined due to their close proximity and because of the similar relevance values they contain (BLM Manual 161322A5). This nominated ACEC contains gypsum outcrops of the Hermosa geologic formation that are the habitat of rare plants. Elevation is 6,100 to 6,500 feet and size is about 18,931 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Gypsum Valley cat-eye, G1 ranked <i>Lecanora gypsicola</i> , S1 ranked nodule cracked lichen ( <i>Acarospora nodulosa</i> var. <i>nodulosa</i> ), S2 ranked flex-stemmed mariposa lily ( <i>Calochortus uniflorus</i> ), S1 ranked Nealley's dropseed ( <i>Sporobolus nealleyi</i> ), G2 ranked Naturita milkvetch, and S2 ranked short-stem penstemon, which are all natural systems in the form of rare terrestrial plant species. This site also meets the relevance criteria because Gypsum Valley cat-eye and Naturita milkvetch are natural systems that are on the BLM State Director's sensitive species list. This site also meets the relevance criteria because it contains unique gypsum outcrops, which are a natural system in the form of a rare geological feature.
Importance criteria	Gypsum Valley cat-eye, <i>Lecanora gypsicola</i> , nodule cracked lichen, flex-stemmed mariposa lily, Naturita milkvetch, Short-stem penstemon, and Nealley's dropseed meet the importance criteria because their rarity (G1, G2, S1, or S2 NatureServe Conservation Status ranks) gives them more than locally significant qualities, which gives them special worth and cause for concern (they are at a high risk of global extinction or state extirpation because they have such few occurrences), and these species meet the importance criteria because their rarity gives them qualities that make them sensitive, unique, rare, and vulnerable to adverse change. Gypsum Valley cat-eye also meets the importance criteria because a large portion of its entire range and most of the documented occurrences of the species are on the TRFO, which gives it more than locally significant qualities that are of special worth and cause for concern. Gypsum Valley cat-eye and Naturita milkvetch also meet the importance criteria because of their designation on the BLM State Director's sensitive species lists, which gives them special worth, meaning,

	distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Gypsum Valley cat-eye, <i>Lecanora gypsicola</i> , nodule cracked lichen, Naturita milkvetch, short-stem penstemon, and flex-stemmed mariposa lily also meet the importance criteria because of their designation as high-priority species in the San Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. The gypsum outcrops also meet the importance criteria because they have qualities or circumstances that make them sensitive, rare, unique, and vulnerable to adverse change.
Determination	The Gypsum Valley nominated ACEC meets both the relevance and importance criteria so it was identified as a potential ACEC and further analyzed in the BLM planning process. In addition to the general management prescriptions, special management attention (in the form of additional management prescriptions specific to this ACEC, as described above) is needed to protect the outstanding and vulnerable relevance values within this ACEC because this ACEC is subject to many ground-disturbing management activities (including off-road-vehicle use, livestock grazing, and oil and gas development) that could disturb many acres; because the relevance values are subject to competition from invasive plants (brought in on the extensive road network within this ACEC), which could quickly become established on the many acres affected by the many ground-disturbing management activities associated with this ACEC; because this ACEC contains three occurrences of a G1 ranked species ( <i>Lecanora gypsicola</i> ), five occurrences of a G2 ranked species Gypsum Valley cat-eye), three occurrences of an S1 ranked species (nodule cracked lichen <i>Acarospora nodulosa var. nodulosa</i> , and an occurrence of S1 ranked Nealley's dropseed, all of which are highly vulnerable to disturbance and extinction; because of the significance of the habitat within this ACEC since the ACEC contains such a large portion of the entire range, much of the total known habitat, and many of the total documented occurrences of Gypsum Valley cat-eye, which means that management actions within this ACEC could have a significant effect on the long-term viability of that species; because the gypsum soils habitat for Gypsum Valley cat-eye, and the gypsum rim lichen is easily disturbed and highly erosive; because this site has a biodiversity rank of B1 for outstanding biodiversity significance; and because this area is easily accessible (highly roaded and relatively flat topography). This potential ACEC is considered for ACEC designation in Alternatives B and C.

#### Horse Range Mesa

Nominator	LRMP interdisciplinary planning team
Location	San Miguel County, Colorado
Description	This nominated ACEC occurs in the Morrison geologic formation. Brigham Young University
	excavated vertebrae of a Camasaurus dinosaur specimen from this site and wrote a report on its
	findings. Elevation is 6,700 feet and size is 160 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains a Camasaurus dinosaur specimen,
	which is a natural system in the form of a rare geological feature.
Importance	The Camasaurus dinosaur specimen does not meet the importance criteria because according to
criteria	the associated BYU report, the dinosaur specimen does not have more than locally significant
	qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for
	concern, and the dinosaur specimen does not have qualities or circumstances that make it
	fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable
	to adverse change.
Determination	The Horse Range Mesa nominated ACEC meets the relevance criteria but does not meet the
	importance criteria so it was not identified as a potential ACEC.

#### Lake Como

Nominator	LRMP interdisciplinary planning team
Location	San Juan County, about 7 air miles north-northeast of Silverton
Description	This nominated ACEC contains BLM lands within the Lake Como PCA. It is a turquoise lake
	at the headwaters of the Uncompangre River. Elevation is 12,000 to 13,447 feet and size is 100
	acres of BLM land.

Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Rocky Mountain draba ( <i>Draba</i>
	graminea), which is a natural system in the form of a rare (G2 rank) terrestrial plant species.
Importance	Rocky Mountain draba meets the importance criteria because it has more than locally
criteria	significant qualities due to its rarity (G2 rank), which gives it special worth and cause for
	concern, and Rocky Mountain draba meets the importance criteria because its rarity gives it
	qualities that make it sensitive, unique, rare, and vulnerable to adverse change. Rocky
	Mountain draba also meets the importance criteria because of its designation as a high-priority
	species in the San Juan Biodiversity Model, which gives it special worth, meaning,
	distinctiveness, and cause for concern, and which recognizes it as warranting protection in
	order to carry out the mandates of FLPMA.
Determination	The Lake Como nominated ACEC meets both the relevance and importance criteria, but it does
	not expressly require additional "special management attention" because this potential ACEC
	and its relevance and importance values can be adequately protected from management actions
	and threats by the general LRMP management prescriptions and because it occurs in a
	relatively remote location at high elevations in the alpine zone where management actions are
	unlikely and threats are minimal.
Proposed LRMP Direction to Protect Relevance and Importance Values within Lake Como	
Rocky Mountain	Protection of this value will be considered during project-level analysis of any management
draba	actions or project proposals.

McIntyre Canyon

McIntyre Canyon	
Nominator	San Juan Citizens Alliance, Center for Native Ecosystems
Location	5 air miles northwest of Slick Rock, in northwest San Miguel County
Description	This nominated ACEC contains BLM lands within the McIntyre Canyon PCA. McIntyre Canyon is connected to the Dolores River Canyon. Elevation is 5,400 to 6,200 feet and size is 2,980 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Naturita milkvetch and S1 ranked Eastwood's monkeyflower, which are natural systems in the form of rare (G2 and S1 ranks) terrestrial plant species. This site also meets the relevance criteria because Naturita milkvetch and Eastwood's monkeyflower are natural systems that are on the BLM State Director's sensitive species list. This site also meets the relevance criteria because it contains G2 ranked pinyon-/needle-and-thread woodlands, which is a natural system in the form of a rare terrestrial plant community. This site also meets the relevance criteria because it contains G2 ranked Mancos milkvetch - Eastwood's monkeyflower herbaceous vegetation, which is a natural system in the form of a rare terrestrial plant community. This site also meets the relevance criteria because of its significant scenic value.
Importance criteria	Naturita milkvetch, Eastwood's monkeyflower, pinyon-juniper/needle-and-thread woodlands, and Mancos columbine - Eastwood's monkeyflower herbaceous vegetation meet the importance criteria because they have more than locally significant qualities due to their rarity (G2 and S1 ranks), which gives them special worth and cause for concern, and they meet the importance criteria because their rarity gives them qualities that make them fragile, sensitive, rare, and vulnerable to adverse change. Naturita milkvetch and Eastwood's monkeyflower also meet the importance criteria because of their designation on the BLM State Director's sensitive species list, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Naturita milkvetch, Eastwood's monkeyflower, and Mancos columbine - Eastwood's monkeyflower herbaceous vegetation also meet the importance criteria because of their designation as high-priority species or plant communities in the San Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. The scenic value also meets the importance criteria because it has more than locally significant qualities due to the size and depth of the canyon, which gives it special worth and distinctiveness.
Determination	The McIntyre Canyon nominated ACEC meets both the relevance and importance criteria, but it does not expressly require additional "special management attention" because this potential ACEC and its relevance systems can be adequately protected from management actions and

	threats by the general LRMP management prescriptions; because it occurs in a remote	
	location in a steep canyon where management actions are unlikely; because of its topographic	
	inaccessibility; and through its inclusion in the Dolores River Canyon area, which includes	
	LRMP management prescriptions that protect rare plant and animal species, rare plant	
	communities, and scenic values).	
Proposed I R	MP Direction to Protect Relevance and Importance Values within McIntyre Canyon	
values	,	
values	2.2.73 Agency actions should be designed to avoid or minimize impacts in canyon	
	escarpments, unless the activity is designed to maintain or restore the composition, structure,	
	or function of the terrestrial ecosystems within those escarpments.	
Notarita millaretale	NSO: Dolores River Canyon.  CSM Colored RIVER Colored Col	
Naturita milkvetch	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's	
F . 12	sensitive plants.	
Eastwood's	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied	
monkeyflower	by special status plant species must be designed to maintain the hydrologic systems necessary	
	to support and sustain those species.	
	2.2.72 Agency actions should avoid or otherwise mitigate long-term adverse impacts in	
	terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant	
	community conservation status ranks in order to maintain the ecological integrity of those	
	rare plant communities.	
	• 2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging	
	gardens from management activities in or adjacent to them (including motorized travel, road	
	construction, water pumping, and peat removal) must not occur.	
	2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in	
	riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2	
	NatureServe plant community conservation status ranks, including wild privet (Forestiera	
	pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis) woodlands,	
	in order to maintain the ecological integrity of those rare plant communities.	
	3.23.9 Management activities and recreational use should avoid or minimize impacts to rare	
	or unique plant communities.	
	NSO: Perennial streams, water bodies, riparian areas, and fens.	
	CSU: Perennial streams, water bodies, riparian areas, and fens.	
	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's	
	sensitive plants.	
Pinyon pine/Utah	2.2.72 Agency actions should avoid or otherwise mitigate long-term adverse impacts in	
juniper/Needle-	terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant	
and-thread	community conservation status ranks in order to maintain the ecological integrity of those	
Woodlands	rare plant communities.	
	• G3.23.9 Management activities and recreational use should avoid or minimize impacts to rare	
	or unique plant communities.	
	CSU: Lands with biological soil crusts.	
Mancos	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied	
columbine-	by special status plant species must be designed to maintain the hydrologic systems necessary	
Eastwood's	to support and sustain those species.	
monkeyflower	2.2.69 Agency actions should avoid or otherwise mitigate long-term adverse impacts in	
herbaceous	terrestrial ecosystems that have plant communities with G1 or G2 NatureServe plant	
vegetation	community conservation status ranks in order to maintain the ecological integrity of those	
	rare plant communities.	
	• 2.4.19 Long-term adverse effects to the hydrology, soils, and vegetation of fens and hanging	
	gardens from management activities in or adjacent to them (including motorized travel, road	
	construction, water pumping, and peat removal) must not occur.	
	2.4.23 Agency actions should avoid or otherwise mitigate long-term adverse impacts in	
	riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2	
	NatureServe plant community conservation status ranks, including wild privet (Forestiera	

	pubescens) shrublands and boxelder/river birch (Acer negundo/Betula fontinalis) woodlands,
	in order to maintain the ecological integrity of those rare plant communities.
	• G3.23.9 Management activities and recreational use should avoid or minimize impacts to rare
	or unique plant communities.
	NSO: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's
	sensitive plants.
Significant scenic	NSO stipulation: High scenic integrity objective and VRM Class II areas.
value	

### **Mesa Verde Entrance**

Mesa verue Entrance		
Nominator	LRMP interdisciplinary planning team	
Location	Montezuma County, east of Cortez near the entrance to Mesa Verde National Park.	
Description	This nominated ACEC contains BLM lands within the Mesa Verde Entrance PCA. Elevation is	
	6,800 to 8,427 feet and size is 1,268 acres of BLM land.	
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Gray's Townsend daisy	
	(Townsendia glabella), S1 ranked large-flowered wild hollyhock (Iliamna grandiflora), S2	
	ranked San Juan gilia (Gilia haydenii), and S2 ranked short-stem penstemon, which are all	
	natural systems in the form of rare (G2, S1, and S2 ranks) terrestrial plant species.	
Importance	Gray's Townsend daisy, large-flowered wild hollyhock, San Juan gilia, and short-stem	
criteria	penstemon meet the importance criteria because they have more than locally significant	
	qualities due to their rarity (G2, S2, and S1 ranks), which give them special worth and cause for	
	concern, and because they have qualities that make them sensitive, unique, and vulnerable to	
	adverse change. Short-stem penstemon also meets the importance criteria because of its	
	designation as a high-priority species in the San Juan Biodiversity Model, which gives it special	
	worth, meaning, distinctiveness, and cause for concern, and which recognizes it as warranting	
	protection in order to carry out the mandates of FLPMA.	
Determination	The Mesa Verde Entrance nominated ACEC meets both the relevance and importance criteria,	
	but it does not expressly require additional "special management attention" because this	
	potential ACEC and its relevance systems can be adequately protected from management	
	actions and threats by the general LRMP management prescriptions.	
	MP Direction to Protect Relevance and Importance Values within Mesa Verde Entrance	
Common to all	• CSU: Lands with 25% to 35% slopes and lands with shale soils.	
values		
Gray's Townsend	See protections common to all values.	
daisy		
Large-flowered	See protections common to all values.	
wild hollyhock		
San Juan gilia	See protections common to all values.	
Short-stem	See protections common to all values.	
penstemon		

### **Muleshoe Bench**

Nominator	LRMP interdisciplinary planning team
Location	San Miguel County, Colorado, southeast of the confluence of Coyote Wash and the Dolores
	River.
Description	This nominated ACEC contains BLM lands within the Muleshoe Bench PCA. Its size is 663
	acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains S2 ranked needle-and-thread Great
	Basin herbaceous vegetation, which is a natural system in the form of a rare terrestrial plant
	community.
Importance	Needle-and-thread Great Basin herbaceous vegetation meets the importance criteria because it
criteria	has more than locally significant qualities due to its rarity (S2 rank), which gives it special

	worth and cause for concern, and this plant community meets the importance criteria because		
	its rarity gives it qualities that make it unique, rare, and vulnerable to adverse change.		
Determination	The Muleshoe Bench nominated ACEC meets both the relevance and importance criteria, but it		
	does not expressly require additional "special management attention" because this potential		
	ACEC and its relevance systems can be adequately protected from management actions and		
	threats by the general LRMP management prescriptions, because it occurs in a remote location		
	where management actions are unlikely, because of its topographic inaccessibility, and through		
	its inclusion in the Dolores River Canyon WSA.		
Proposed L	Proposed LRMP Direction to Protect Relevance and Importance Values within Muleshoe Bench		
Common to all	Within Dolores River WSA.		
values			
Needle-and-	See protections common to all values.		
thread Great			
Basin herbaceous			
vegetation			

### Northdale

Nominator	LRMP interdisciplinary planning team
Location	Dolores County, north and west of Dove Creek, and a small piece in San Miguel County
Description	This nominated ACEC contains BLM lands within the Northdale/Dove Creek PCA. It contains parcels of BLM land that are occupied by the Dove Creek subpopulation of the Gunnison sagegrouse, and has been proposed as critical habitat for the grouse. Almost all habitat occupied by
	the sage grouse in this general area is on private lands. Elevation ranges from 6,600 to 8,100 feet. Size is 875 acres of BLM land. The Dove Creek subpopulation is threatened by habitat loss from subdivisions, poor habitat quality and quantity, low existing genetic diversity, and lack of linkages with other populations. Management is guided by the CPW through the Gunnison Sage-grouse Rangewide Conservation Plan.
Relevance criteria	This site meets the relevance criteria because it contains G1 ranked Gunnison sage-grouse (and its habitat), which is a rare wildlife resource, and it meets the relevance criteria because the Gunnison sage-grouse is a wildlife resource that is on the BLM State Director's sensitive species list.
Importance criteria  Determination	Gunnison sage-grouse meets the importance criteria because its rarity (G1 rank) gives it more than locally significant qualities, which gives it special worth, distinctiveness, and cause for concern, and it meets the importance criteria because its rarity gives it qualities or circumstances that make it sensitive, rare, unique, threatened, and vulnerable to adverse change. The Gunnison sage-grouse also meets the importance criteria because of its designation on the BLM State Director's sensitive species list, which gives it special worth, meaning, distinctiveness, and cause for concern, and which recognizes it as warranting protection in order to carry out the mandates of FLPMA. The Gunnison sage-grouse also meets the importance criteria because of its designation as a high-priority species in the San Juan Biodiversity Model, which gives it special worth, meaning, distinctiveness, and cause for concern, and which recognizes it as warranting protection in order to carry out the mandates of FLPMA.  The Northdale nominated ACEC meets both the relevance and importance criteria, but it does not expressly require additional "special management attention" because this potential ACEC
Propose	and its relevance resources (Gunnison sage-grouse and its habitat) can be adequately protected from management actions and threats by the general LRMP management prescriptions and by guidance in the Gunnison Sage-grouse Rangewide Conservation Plan.  d LRMP Direction to Protect Relevance and Importance Values within Northdale
Gunnison sage-	• 2.3.45 Gunnison sage-grouse: Management activities must not occur from March 1 to June
grouse	30 within occupied habitat suitable for nesting to allow for breeding and December 1 to March 15 for known winter habitat.
	2.3.46 Gunnison sage-grouse: New structural improvements or surface disturbance must not occur within known winter concentration area or within a 0.6-mile radius of known Gunnison sage-grouse leks.  2.3.47 Gunnison sage-grouse leks.
	2.3.47 Gunnison sage-grouse: In occupied habitat fuels treatments must be designed and implemented with an emphasis on protecting and enhancing existing sagebrush ecosystems

- 2.3.48 Gunnison sage-grouse: Invasive vegetation must be monitored and controlled posttreatment.
- 2.3.70 Structures in sage-grouse habitat should be constructed to limit risk of collision and predation
- 2.3.71 New noise sources resulting from management activities should not contribute to noise levels that negatively impact sage-grouse leks during the active lek season (March 1 to June 30) based on best available science.
- 2.3.72 Projects in occupied Gunnison sage-grouse habitat should be designed to mitigate or avoid the direct or indirect loss of habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important habitat necessary for sustainable local populations. Projects will incorporate special reclamation measures or design features that accelerate recovery and/or re-establishment of affected sage-grouse habitat as much as possible.
- 2.3.73 Applicable BMPs should be applied to all mineral proposals as Conditions of Approval within occupied sage-grouse habitat to provide for adequate effective habitat and breeding, nesting, and wintering habitat.
- 2.3.74 Remote methodologies for monitoring, transporting fluids to centralized collection tanks, etc., should be utilized to minimize human disturbance in Gunnison sage-grouse habitat
- 2.3.75 Fuels treatments should be designed to meet strategic protection of identified occupied sage-grouse habitat.
- 2.3.76 Use of native seeds should be used for revegetation following fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998). Where probability of success or native seed availability is low, nonnative seeds may be used as long as they meet sage-grouse habitat objectives
- 2.3.77 Within occupied Gunnison sage-grouse critical habitat the Rangewide Conservation Plan grazing guidelines should be incorporated when appropriate.
- 2.3.78 Within occupied habitat, grazing in treatment areas should be deferred for two growing seasons after treatment, unless needed for seedbed preparation or desired understory and overstory are established.
- 2.3.79 When developing or modifying water developments, BMPs (see Appendix N) should be used to mitigate potential impacts from West Nile virus on sage-grouse within occupied habitat.
- NSO stipulation: Gunnison sage-grouse occupied critical habitat.
- CSU stipulation: Gunnison sage-grouse occupied critical habitat.
- CSU stipulation: Gunnison sage-grouse proposed unoccupied critical habitat.
- CSU stipulation: Gunnison sage-grouse noise restrictions, occupied and unoccupied critical habitat.

#### Picayune Gulch

Nominator	LRMP interdisciplinary planning team
Location	San Juan County, Colorado
Description	This nominated ACEC contains BLM lands within the Picayune Gulch PCA. It is in a mountain
	valley with extensive wetlands. Elevation is 12,000 to 12,200 feet and size is 23 acres of BLM
	land.
Relevance criteria	This site does not meet the relevance criteria because it does not contain appropriate historic,
	cultural, or scenic values, fish or wildlife resources, natural processes or systems, or natural
	hazards. G3S3 ranked alpine tundra draba ( <i>Draba streptobrachia</i> ) and G3S3 ranked thickleaf
	draba (D. crassa) don't meet the relevance criteria because of their relative abundance
	(compared to G1, G2, S1, or S2 ranked species).
Importance	Not applicable.
criteria	
Determination	The Picayune Gulch nominated ACEC does not meet the relevance criteria so it was not
	identified as a potential ACEC and was not further analyzed in the BLM planning process.

Silvey's Pocket

Nominator	San Juan Citizens Alliance, Center for Native Ecosystems
Location	8.5 air miles southwest of Bedrock, in extreme southwestern Montrose County
Description	This nominated ACEC contains BLM lands within the Silvey's Pocket PCA. It includes mesa tops and a broad bench south of Coyote Wash. Elevation is 5,300 to 5,800 feet and size is 707 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Naturita milkvetch and S2 ranked aromatic Indian breadroot ( <i>Pediomelum aromaticum</i> ), which is natural systems in the form of rare (G2 and S2 ranks) terrestrial plant species. This site also meets the relevance criteria because Naturita milkvetch and aromatic Indian breadroot are natural systems that are on the BLM State Director's sensitive species list. This site also meets the relevance criteria because it contains S2 ranked needle-and-thread Great Basin herbaceous vegetation, which is a natural system in the form of a rare terrestrial plant community.
Importance criteria	Naturita milkvetch and aromatic Indian breadroot meet the importance criteria because they have more than locally significant qualities due to their rarity (G2 and S2 ranks), which give them special worth and cause for concern, and these species meet because their rarity gives them qualities that make them sensitive, unique, rare, and vulnerable to adverse change. Naturita milkvetch and aromatic Indian breadroot also meet the importance criteria because of their designation on the BLM State Director's sensitive species list, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Naturita milkvetch and aromatic Indian breadroot also meet the importance criteria because of their designation as high-priority species in the San Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Needle-and-thread Great Basin herbaceous vegetation meets the importance criteria because it has more than locally significant qualities due to its rarity (S2 rank), which gives it special worth and cause for concern, and this plant community meets the importance criteria because its rarity gives it qualities that make it sensitive, rare, and vulnerable to adverse change.
Determination	The Silvey's Pocket nominated ACEC meets both the relevance and importance criteria so it was identified as a potential ACEC and further analyzed in the BLM planning process, but it does not expressly require additional "special management attention" because this potential ACEC and its relevance systems may be adequately protected from management actions and threats by general LRMP management prescriptions; because ground-disturbing management activities will affect a small number of acres; because the threat from invasive plants is minor; because it does not contain any species or plant communities that have a G1 or S1 NatureServe Conservation Status rank; because its biodiversity rank is B3; because the habitat for its rare plant species has no special significance; and because this ACEC occurs in a relatively remote location with few roads within and adjacent to it. Silvey's Pocket potential ACEC is considered for ACEC designation in Alternative C.

### Slick Rock

Nominator	San Juan Citizens Alliance, Center for Native Ecosystems
Location	San Miguel County approximately 18 miles north of the town of Dove Creek
Description	This nominated ACEC contains BLM lands within the Slick Rock and Slick Rock Hill PCAs. It
	does not include Poverty Flats or lands within the Dolores River Canyon. These nominated
	ACECs were combined due to their close proximity and because of the similar relevance values
	they contain (BLM Manual 161322A5). Elevation is 5,600 to 7,200 feet and size is 3,340
	acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 ranked Naturita milkvetch and S2
	ranked short-stem penstemon, which are natural systems in the form of rare (G2 and S2 ranks)
	terrestrial plant species. This site also meets the relevance criteria because Naturita milkvetch a
	natural system that is on the BLM State Director's sensitive species list. This site also meets the
	relevance criteria because it contains canyon tree frog, which is a wildlife resource that is on
	the BLM State Director's sensitive species list. This site also meets the relevance criteria

	The state of the Country of the state of Country of the state of the s
	because it contains S2 ranked needle-and-thread Great Basin herbaceous vegetation, which is a
T .	natural system in the form of a rare terrestrial plant community.
Importance criteria	Naturita milkvetch, short-stem penstemon, and canyon tree frog meet the importance criteria because they have more than locally significant qualities due to their rarity (G2 and S2 ranks), which gives them special worth and cause for concern, and these species meet the importance criteria because their rarity gives them qualities that make them sensitive, unique, rare, and vulnerable to adverse change. Naturita milkvetch, short-stem penstemon, and canyon tree frog also meet the importance criteria because they have more than locally significant qualities due to their designation as BLM State Director's sensitive species, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Naturita milkvetch, short-stem penstemon, and canyon tree frog also meet the importance criteria because of their designation as high-priority species in the San Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause for concern, and which recognizes them as warranting protection in order to carry out the mandates of FLPMA. Needle-and-thread Great Basin herbaceous vegetation meets the importance criteria because it has more than locally significant qualities due to its rarity (S2 rank), which gives it special worth and cause for concern, and this plant community meets the importance criteria because its rarity gives it qualities that make it sensitive, unique, rare, and vulnerable to adverse change.
Determination	Slick Rock nominated ACEC meets both the relevance and importance criteria but it does not expressly require additional "special management attention" because this potential ACEC and
	its relevance resources and systems can be adequately protected from management actions and
D	threats by the general LRMP management prescriptions.
Common to all	d LRMP Direction to Protect Relevance and Importance Values within Slick Rock
values	• Within Dolores River Canyon area (except for those parcels within U.S. Department of Energy lease tracts) (see Volume 2, Section 3.23).
Naturita milkvetch	• CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive plants.
Short-stem penstemon	See protections common to all values.
Canyon tree frog and its habitat	<ul> <li>2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are occupied by special status plant species must be designed to maintain the hydrologic systems necessary to support and sustain those species.</li> <li>2.3.50 In order to determine site occupation, pre-implementation surveys may be required for projects occurring in habitats that may support populations of sensitive species and species listed or proposed under the ESA, as determined by an agency biologist.</li> <li>NSO: Perennial streams, water bodies, riparian areas, and fens.</li> <li>CSU: Perennial streams, water bodies, riparian areas, and fens.</li> </ul>
Needle-and- thread Great Basin herbaceous vegetation	3.23.9 Management activities and recreational use should avoid or minimize impacts to rare or unique plant communities.

Snaggletooth

Nominator	LRMP interdisciplinary planning team
Location	Six miles east of Dove Creek in Dolores and San Miguel Counties, Colorado
Description	This nominated ACEC includes a 30 mile stretch of the Dolores River Canyon from the
	Bradfield Bridge downstream to approximately river mile 125. A large part of the site is
	roadless and remote. It is included in the Dolores River Canyon Special Management Area.
	Elevation is 5,600 to 6,500 feet and size is 19,427 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G2 (rounded) ranked roundtail chub
	(and its habitat), which is a rare fish resource. This site also meets the relevance criteria because
	it contains roundtail chub, flannelmouth sucker, and bluehead sucker (Catostomus discobolus)
	(and their habitat), which are fish resources that are on the BLM State Director's sensitive

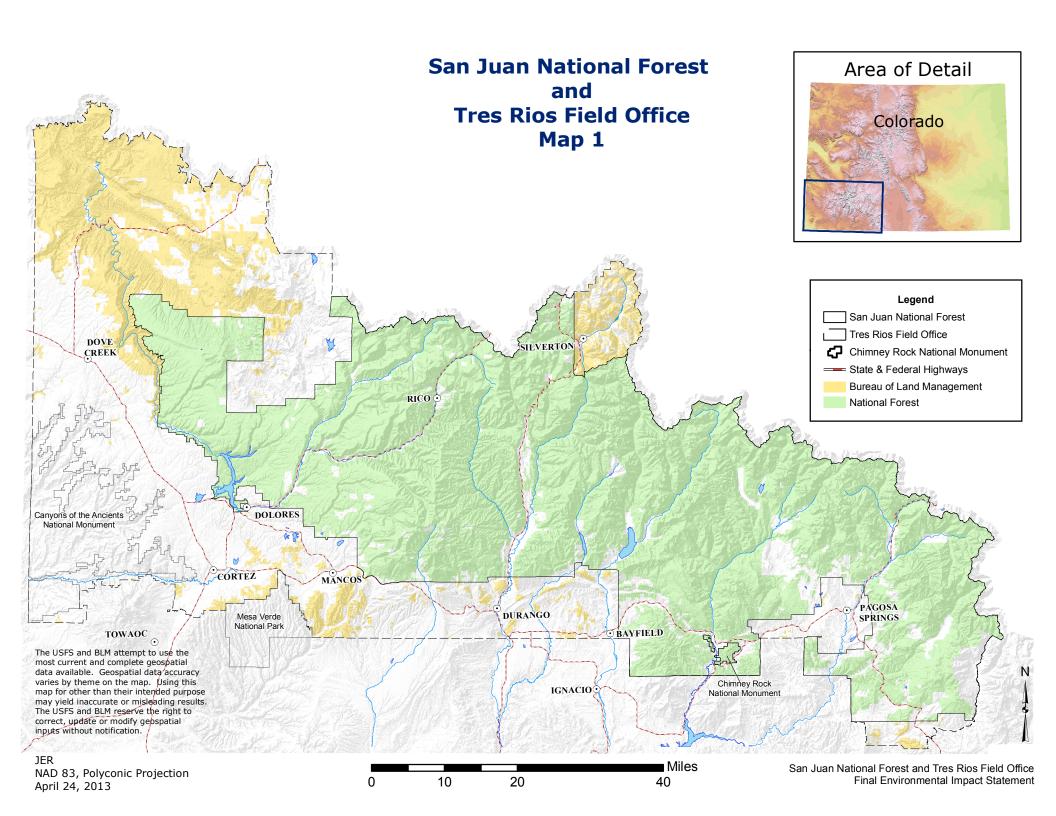
	species list. This site also meets the relevance criteria because it contains G2 peregrine falcon
	(and its habitat), which is a rare wildlife resource that is on the BLM State Director's sensitive
	species list. It also meets the relevance criteria because of its significant scenic value in the
	form of diverse and extreme topography, and diverse and colorful sedimentary geology.
Importance	Roundtail chub and peregrine falcon meet the importance criteria because they have more than
criteria	locally significant qualities due to their rarity (G2 ranks), which gives them special worth and
	cause for concern. Roundtail chub and peregrine falcon also meet the importance criteria
	because their rarity gives them qualities that make them fragile, sensitive, rare, and vulnerable
	to adverse change. Roundtail chub, flannelmouth sucker, peregrine falcon, and bluehead sucker
	also meet the importance criteria because of their designation on the BLM State Director's
	sensitive species list, which gives them special worth, meaning, distinctiveness, and cause for
	concern, and which recognizes them as warranting protection in order to carry out the mandates
	of FLPMA. Roundtail chub, flannelmouth sucker, bluehead sucker, and peregrine falcon also meet the importance criteria because of their designation as high-priority species in the San
	Juan Biodiversity Model, which gives them special worth, meaning, distinctiveness, and cause
	for concern, and which recognizes them as warranting protection in order to carry out the
	mandates of FLPMA. The scenic value also meets the importance criteria because it has more
	than locally significant qualities due to the large size and extreme depth of the canyon and the
	diverse colorful geology of the canyon, which gives it special worth and distinctiveness.
Determination	The Snaggletooth nominated ACEC meets both the relevance and importance criteria, but it
200111111111111111111111111111111111111	does not expressly require additional "special management attention" because this potential
	ACEC and its relevance resources and systems can be adequately protected from management
	actions and threats by the general LRMP management prescriptions; because it occurs in a
	remote location in a steep canyon where management actions are unlikely; because of its
	topographic inaccessibility; and through its inclusion in the Dolores River Canyon Special area.
Proposed	LRMP Direction to Protect Relevance and Importance Values within Snaggletooth
Common to all	Within Dolores River Canyon area (see Volume 1, Section 3.23).
values	Within lands with wilderness characteristics.
	NSO stipulation: Dolores River Canyon.
Roundtail chub	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are
habitat	occupied by special status plant species must be designed to maintain the hydrologic
	systems necessary to support and sustain those species.
	NSO: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Perennial streams, water bodies, riparian areas, and fens.
	NSO stipulation: Major river corridors.
Flannelmouth	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are
sucker and its	occupied by special status plant species must be designed to maintain the hydrologic
habitat	systems necessary to support and sustain those species.
	NSO: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Perennial streams, water bodies, riparian areas, and fens.
	NSO stipulation: Major river corridors.
Bluehead sucker	• 2.2.67 Projects or activities occurring in fens, wetlands, or hanging gardens that are
	occupied by special status plant species must be designed to maintain the hydrologic
	systems necessary to support and sustain those species.
	NSO: Perennial streams, water bodies, riparian areas, and fens.
	CSU: Perennial streams, water bodies, riparian areas, and fens.
	NSO stipulation: Major river corridors.
Peregrine falcon	• 2.3.25 Protection of nests from new structures and human encroachment (see LRMP Table
and its habitat	2.3.2)
	NSO stipulation: Perennial streams, water bodies, riparian areas, and fens.
	CSU stipulation: Perennial streams, water bodies, riparian areas, and fens.
	NSO stipulation: Major river corridors.
Significant scenic	NSO stipulation: High scenic integrity objective and VRM Class II areas.
value	

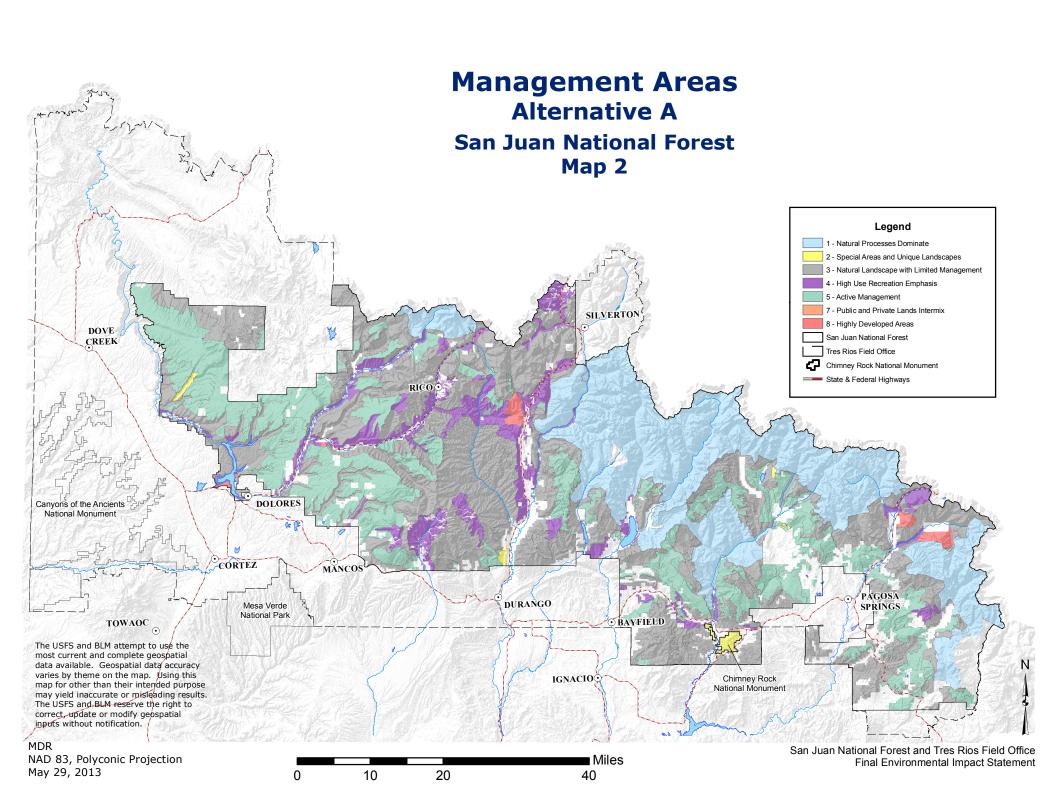
Spring Creek Basin

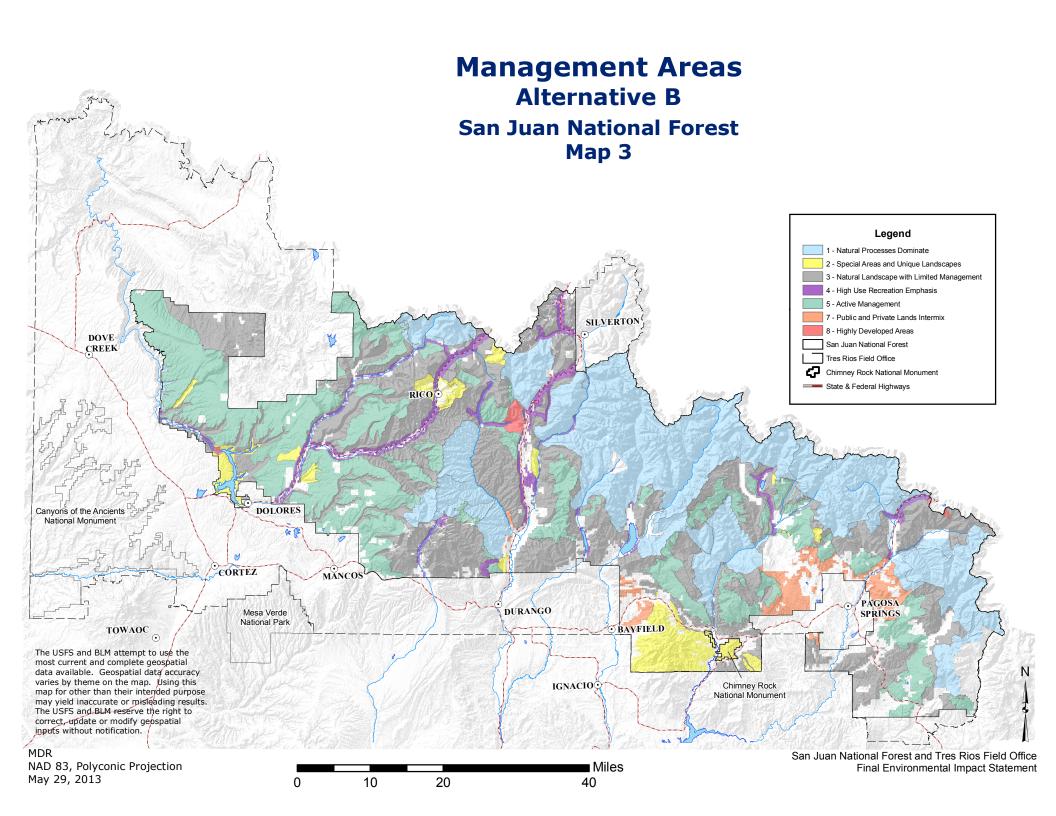
Spring Creek Basi	
Nominator	LRMP interdisciplinary planning team
Location	San Miguel County about 20 miles north of Dove Creek near the foot of McKenna Peak
Description	This nominated ACEC contains BLM lands within the Spring Creek Basin PCA. Elevation is
	6,300 feet and size is 5,589 acres of BLM land.
Relevance criteria	This site meets the relevance criteria because it contains G1 ranked Gypsum Valley cat-eye, S1 ranked pygmy sagebrush ( <i>Artemisia pygmaea</i> ), and S2 ranked flex-stemmed mariposa lily, which are natural systems in the form of rare (G1, S1, S2 ranks) terrestrial plant species. This site also meets the relevance criteria because Gypsum Valley cat-eye is a natural system that is on the BLM State Director's sensitive species list.
Importance	Gypsum Valley cat-eye and pygmy sagebrush Artemisia pygmaea meet the importance criteria
criteria	because they have more than locally significant qualities due to their rarity (G1 and S1 ranks), which give them special worth and cause for concern, and these species meet the importance criteria because their rarity gives them qualities that make them sensitive, unique, rare, and
	vulnerable to adverse change. Gypsum Valley cat-eye also meets the importance criteria
	because a large portion of its entire range and most of the documented occurrences of the
	species are on SJNF and TRFO, which gives it more than locally significant qualities that are of
	special worth and cause for concern. Gypsum Valley cat-eye also meets the importance criteria
	because of its designation on the BLM State Director's sensitive species list, which gives it
	special worth, meaning, distinctiveness, and cause for concern, and which recognizes it as
	warranting protection in order to carry out the mandates of FLPMA. Flex-stemmed mariposa
	lily and Gypsum Valley cat-eye also meets the importance criteria because of its designation as
	high-priority species in the San Juan Biodiversity Model, which gives it special worth,
	meaning, distinctiveness, and cause for concern, and which recognizes it as warranting protection in order to carry out the mandates of FLPMA.
Determination	The Spring Creek Basin nominated ACEC meets both the relevance and importance criteria,
Determination	but it does not expressly require additional "special management attention" because this potential ACEC and its relevance systems can be adequately protected from management actions and threats by the general LRMP management prescriptions, and because a portion of it is within the McKenna Peak WSA. Some of this potential ACEC overlaps with the Spring Creek Wild Horse Herd Management Area. The horses are not grazing on the rare plants of the ACEC and do not appear to be affecting the rare plants by trampling, and the horses and rare plants have co-existed within this potential ACEC for an extended time without causing a
	downward trend in the populations of the rare plants.
Proposed LR	MP Direction to Protect Relevance and Importance Values within Spring Creek Basin
Common to all values	• 2.2.68 Projects or activities that occur in shale and gypsum soils that are occupied by special status plant species must be designed to maintain the soil characteristics necessary to support and sustain those species.
	2.2.77 Management activities in areas with biological soil crusts should be designed to minimize adverse impacts to the soil crusts.
	• 2.2.80 Ground disturbance should be limited or otherwise mitigated on gypsum soils and organic soils (histosols) in order to protect the ecological integrity of these rare and unique soils and the rare plants associated with these soils.
	CSU: Lands with gypsum soils.
	CSU: Lands with biological soil crusts.
	Partially within McKenna Peak WSA.
Gypsum Valley	CSU: Colorado BLM State Director's sensitive plants and R2 Regional Forester's sensitive
cat-eye	plants.
Pygmy sagebrush	See protections common to all values.

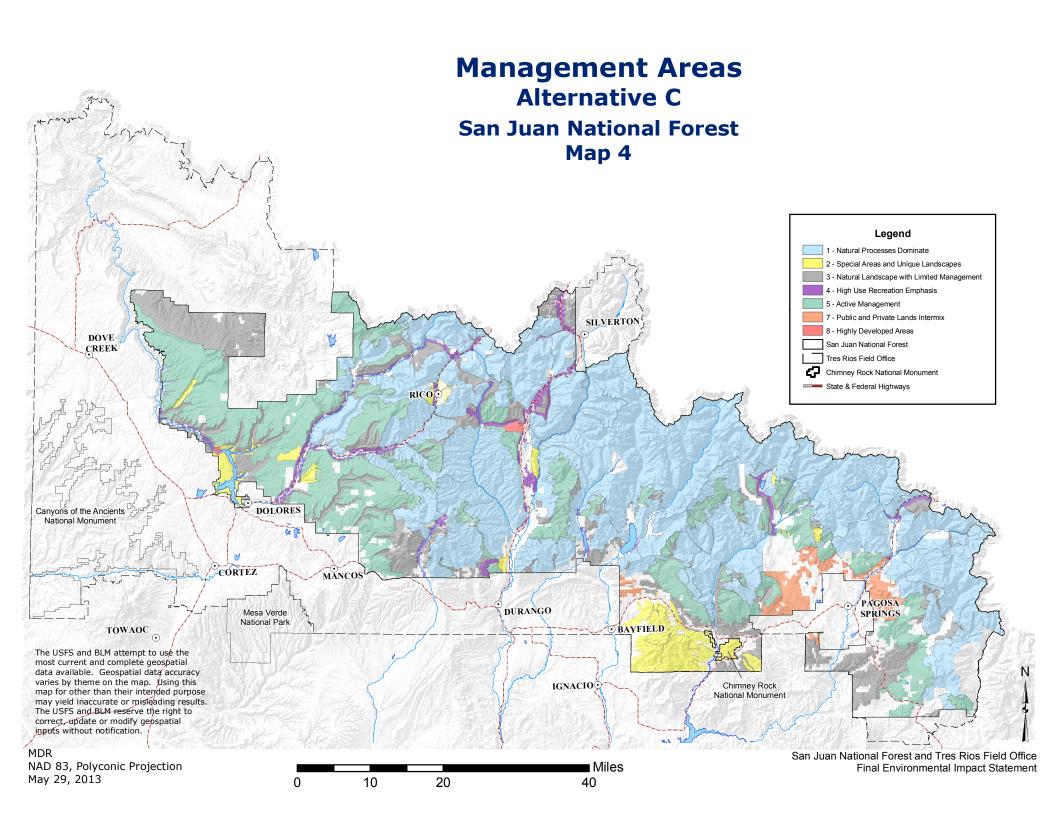
### 1.5. References

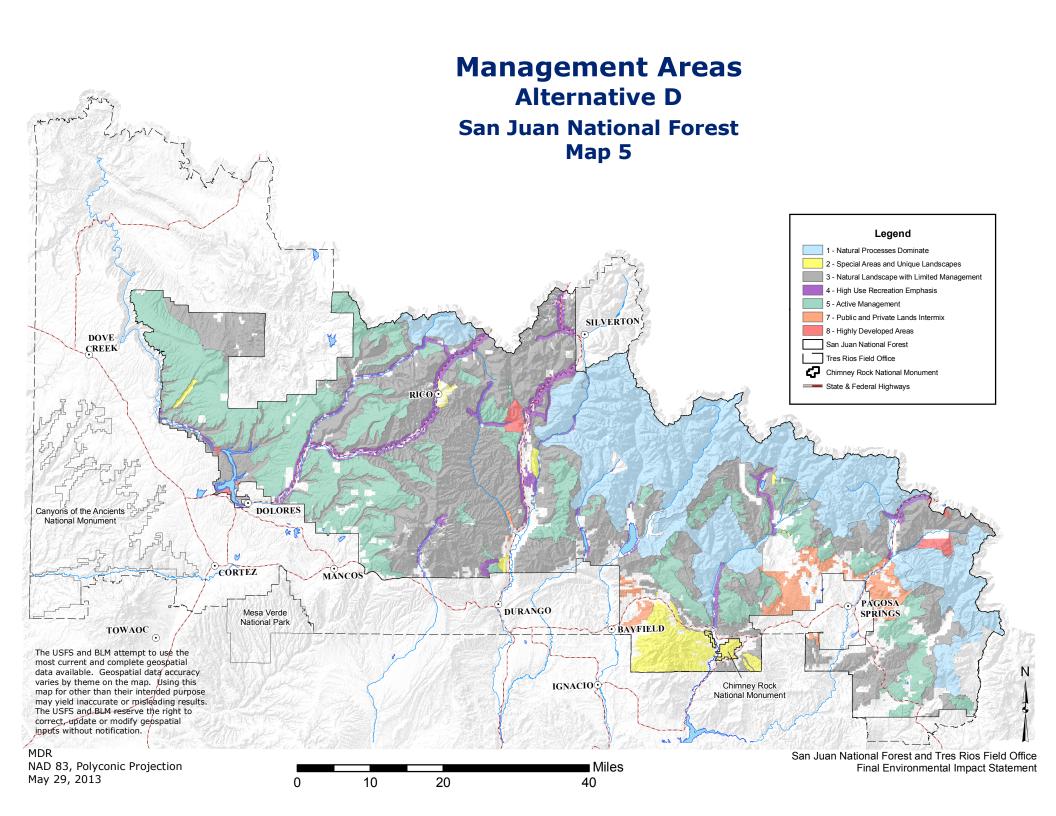
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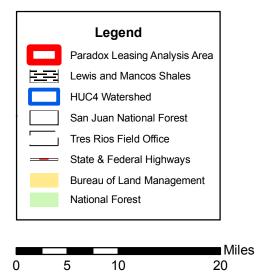






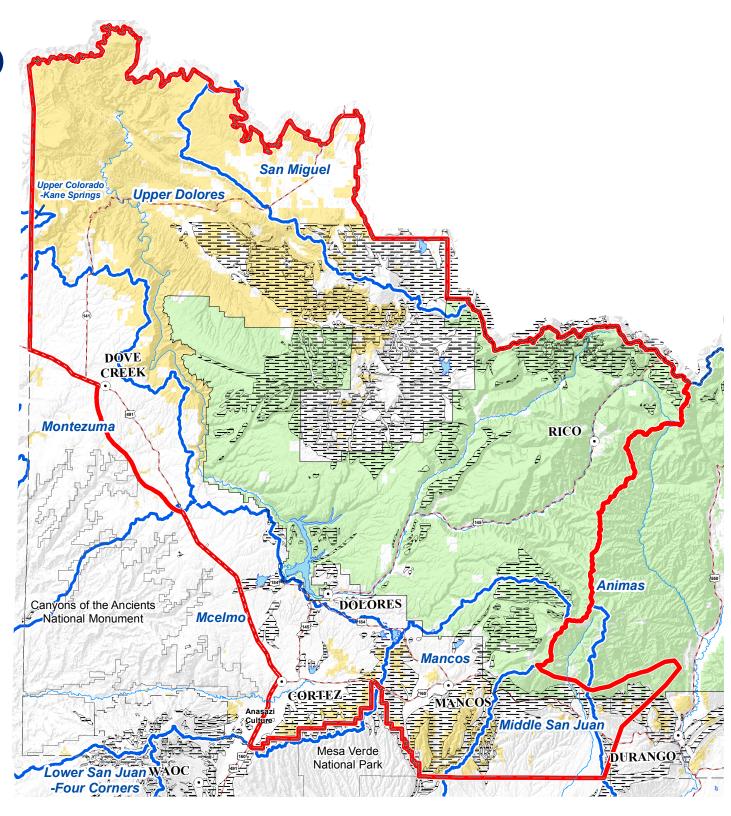
**Major Vegetation Types** San Juan National Forest and Tres Rios Field Office Map 6 Legend Alpine Vegetation Semi-Desert Grassland Semi-Desert Shrubland Mountain Grassland Mountain Shrubland Riparian Area and Wetland Sagebrush Shrubland Aspen Forest Cool-Moist Mixed Conifer Forest Warm-Dry Mixed Conifer Forest Pinyon-Juniper Woodland Ponderosa Pine Forest Spruce-Fir Forest ☐ San Juan National Forest Tres Rios Field Office Chimney Rock National Monument State & Federal Highways Bureau of Land Management National Forest DOLORES DURANGO National Park TOWAOC The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this Chimney Rock IGNACIO map for other than their intended purpose National Monument may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification. ■ Miles San Juan National Forest and Tres Rios Field Office NAD 83, Polyconic Projection 20 Final Environmental Impact Statement 10 40 June 18, 2013

Watersheds (HUC4)
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Analysis Area
San Juan National Forest
and Tres Rios Field Office
Map 7

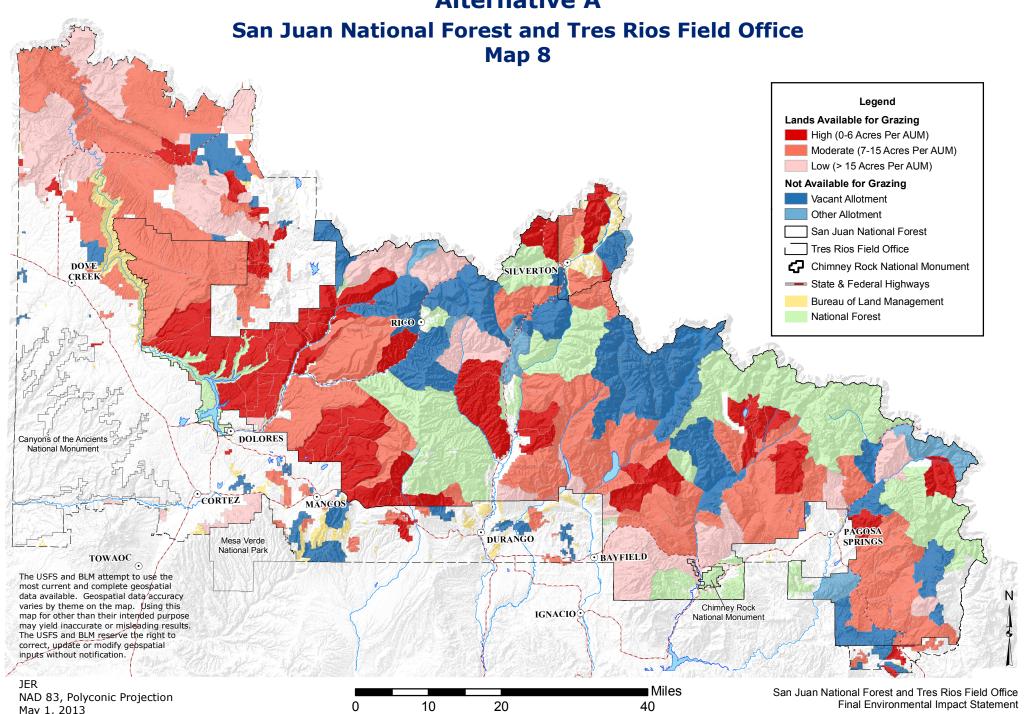


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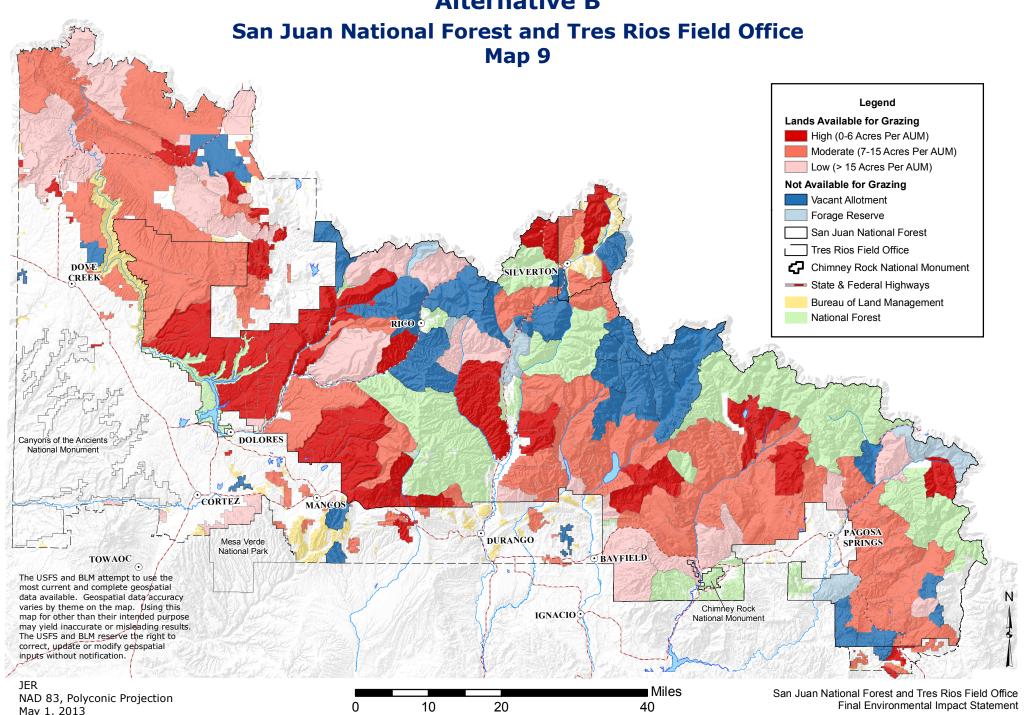
MDR NAD 83, Polyconic Projection May 29, 2013



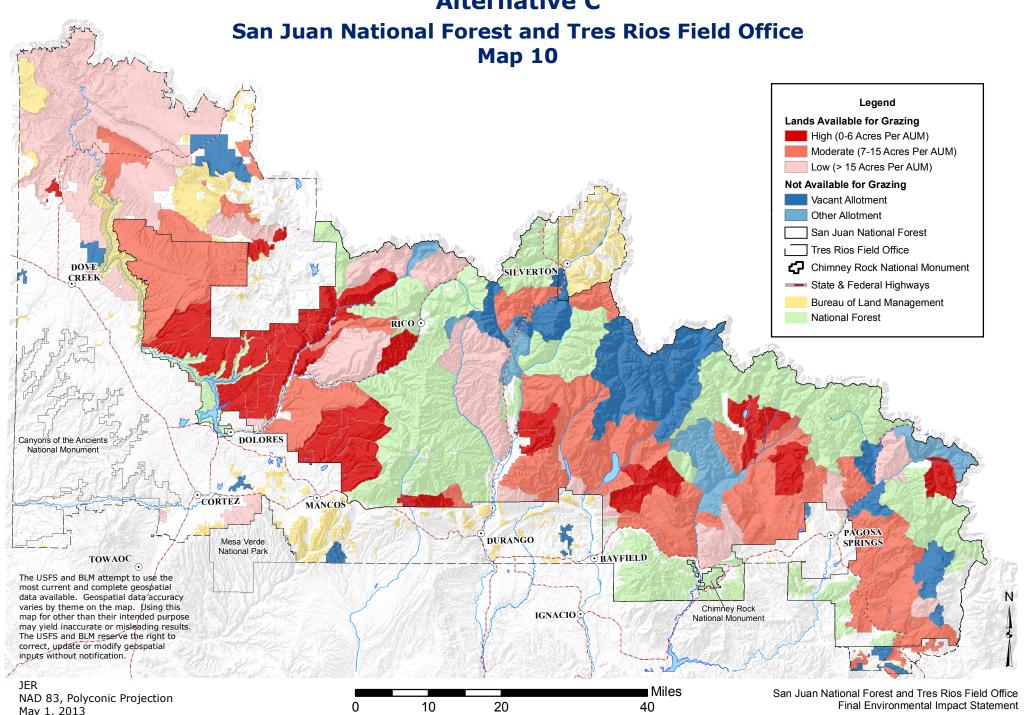
# **Available Grazing Allotments and Comparative Stocking Rates Alternative A**



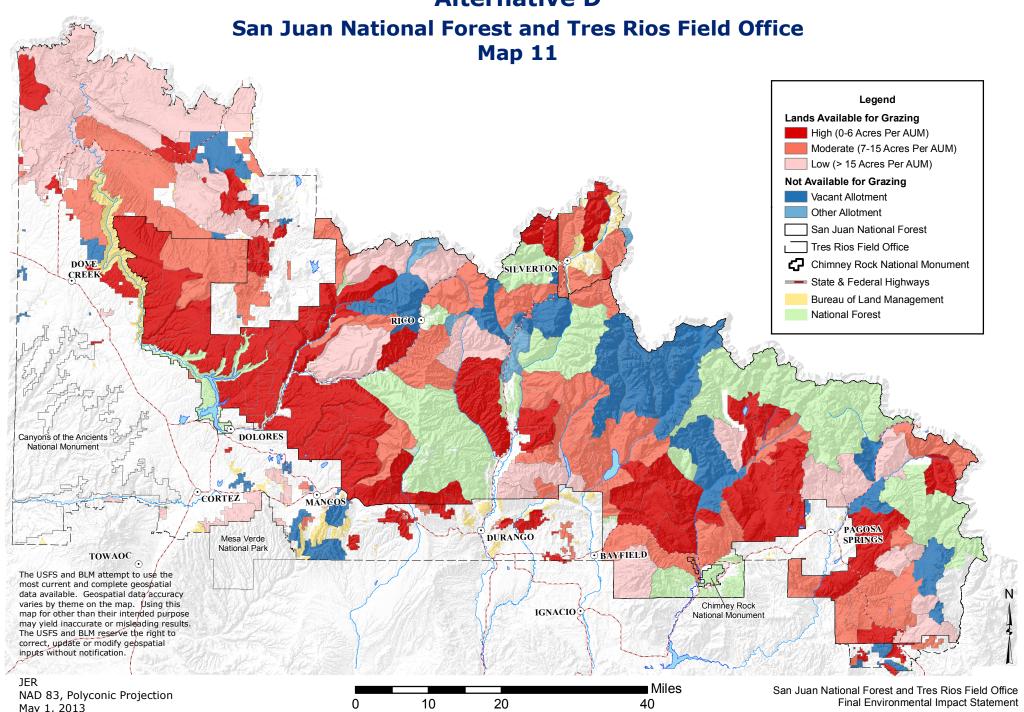
# **Available Grazing Allotments and Comparative Stocking Rates Alternative B**

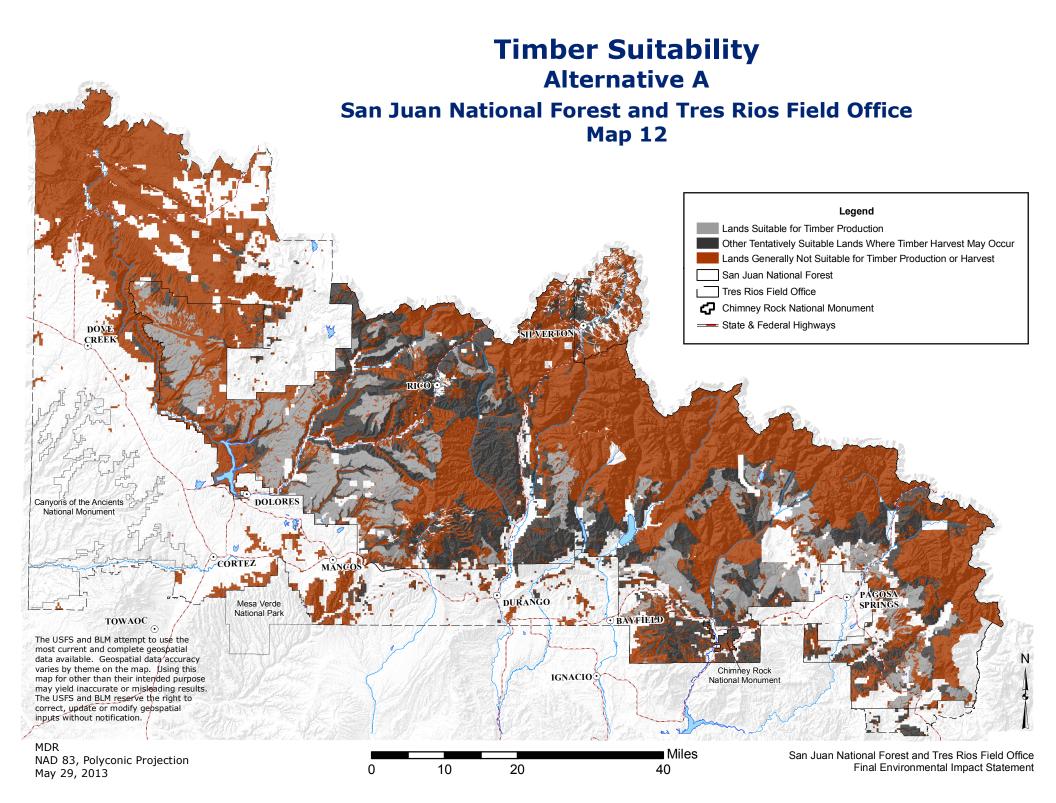


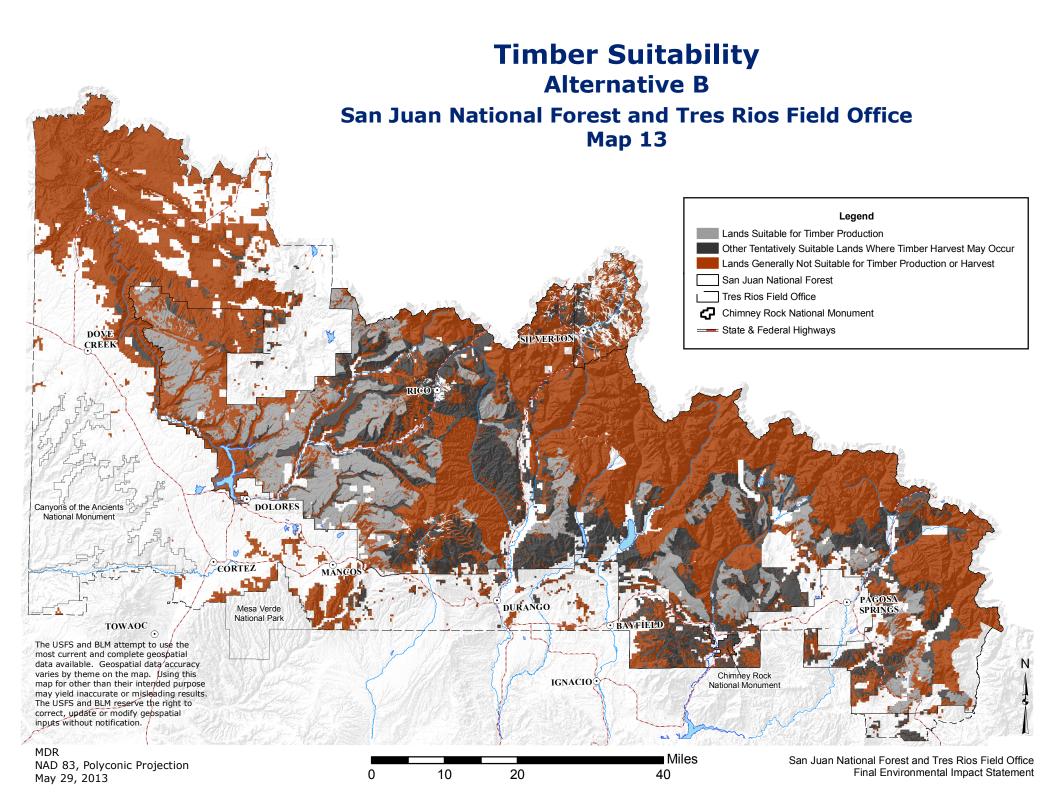
# **Available Grazing Allotments and Comparative Stocking Rates Alternative C**

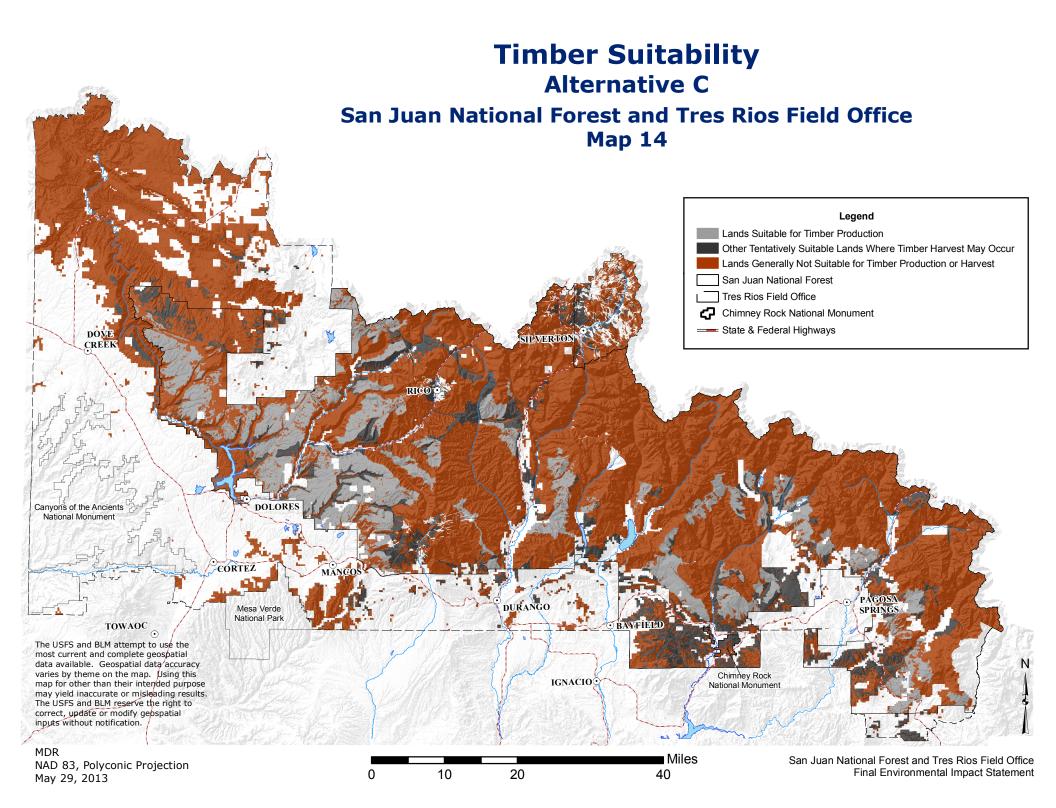


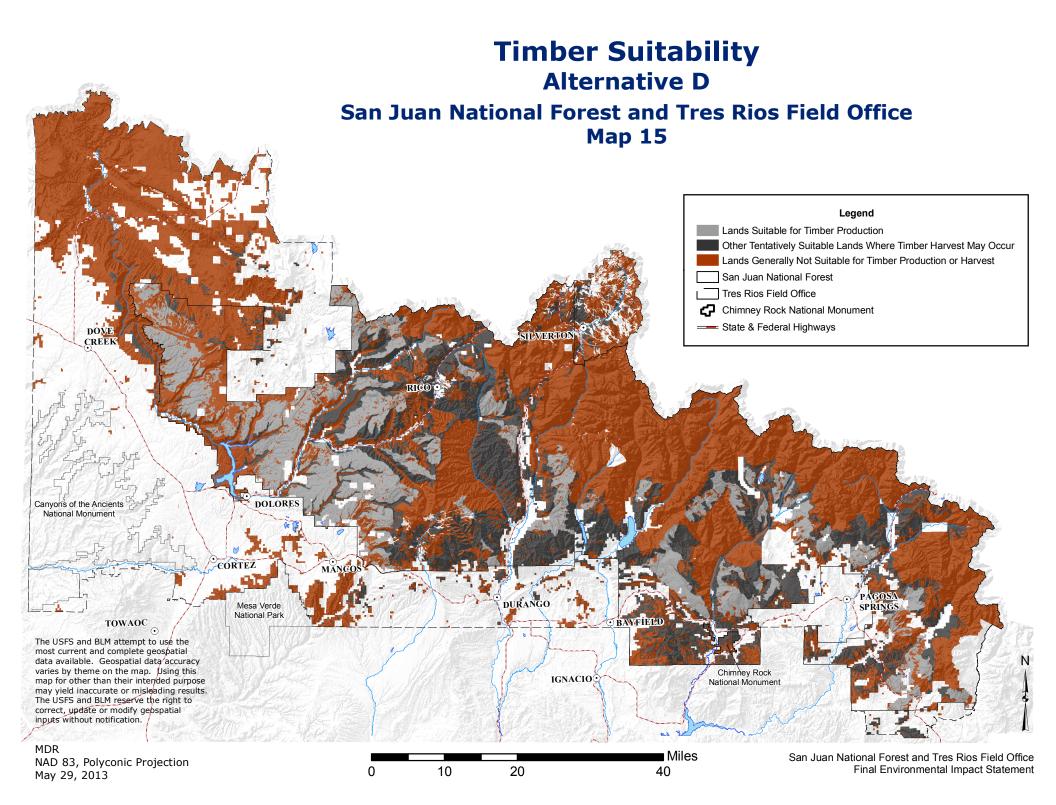
# **Available Grazing Allotments and Comparative Stocking Rates Alternative D**

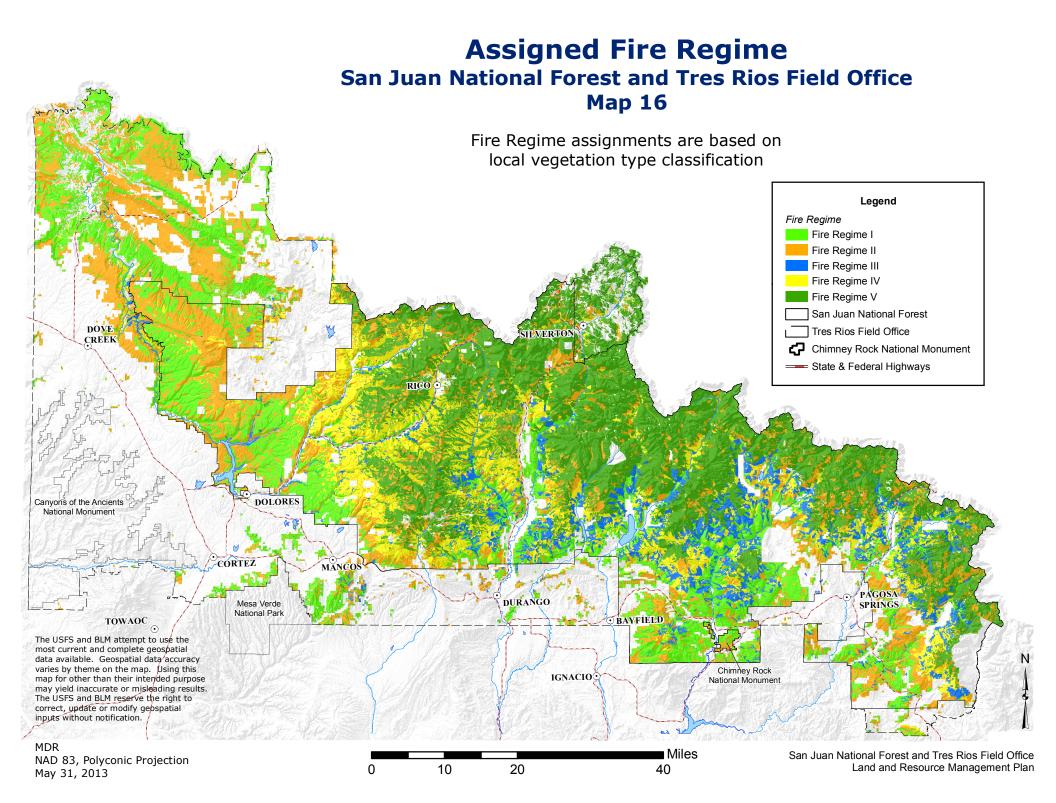


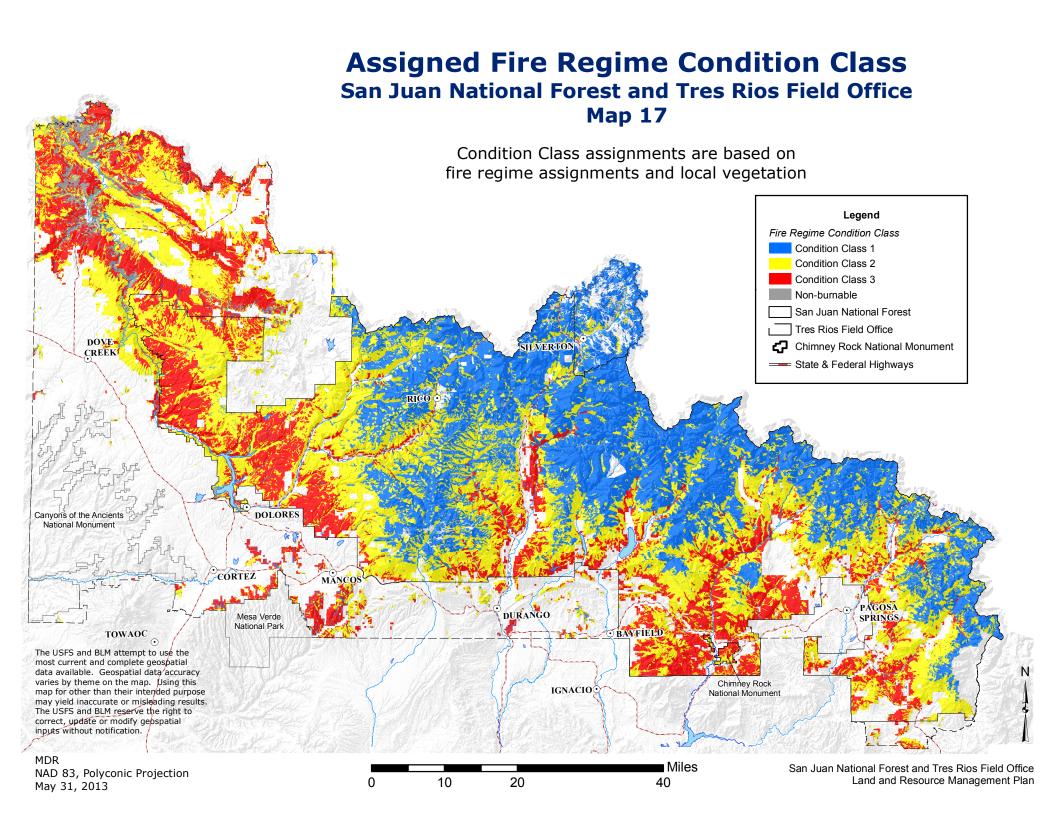




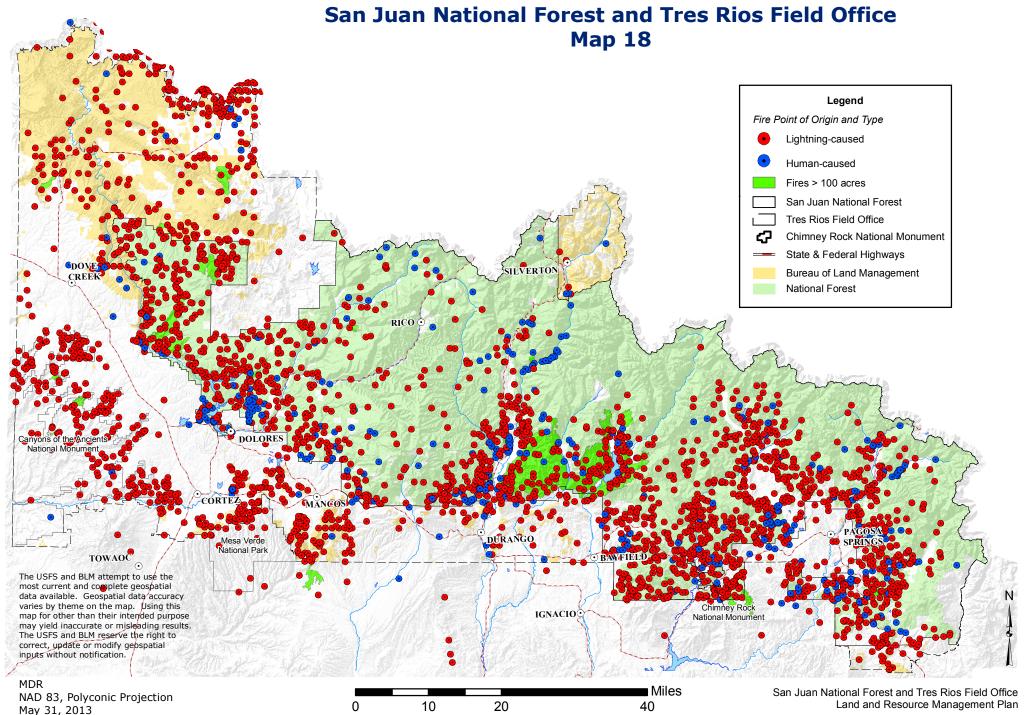


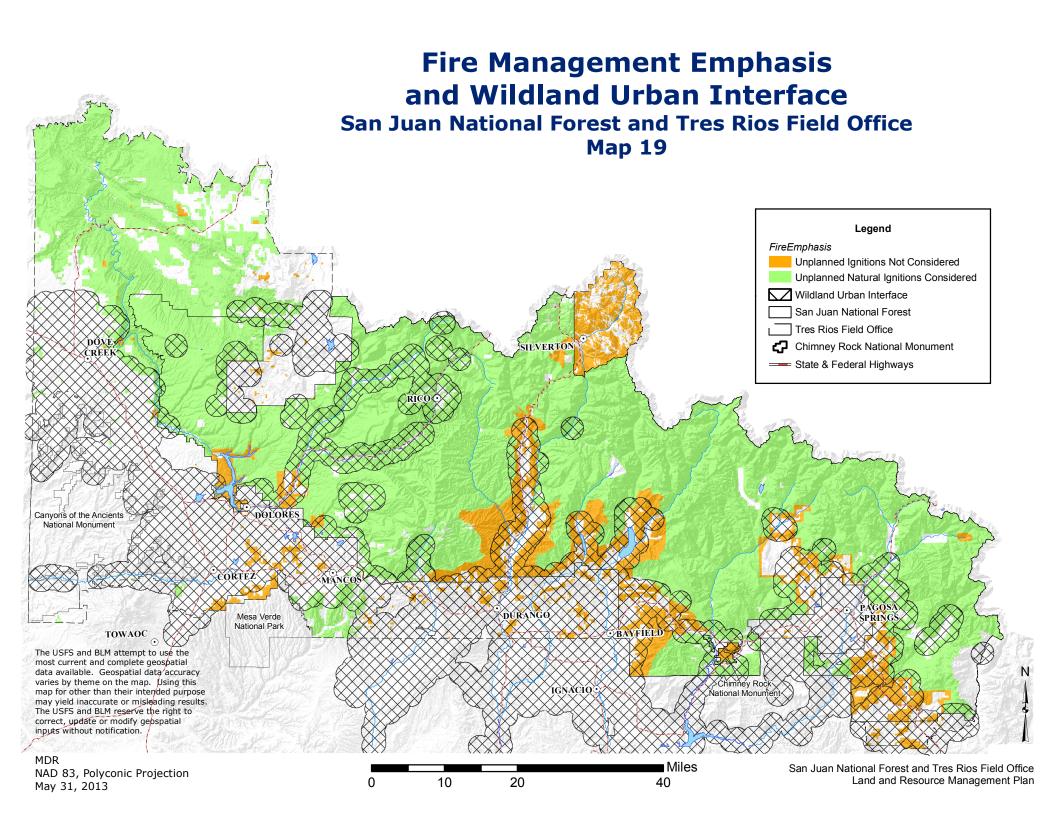




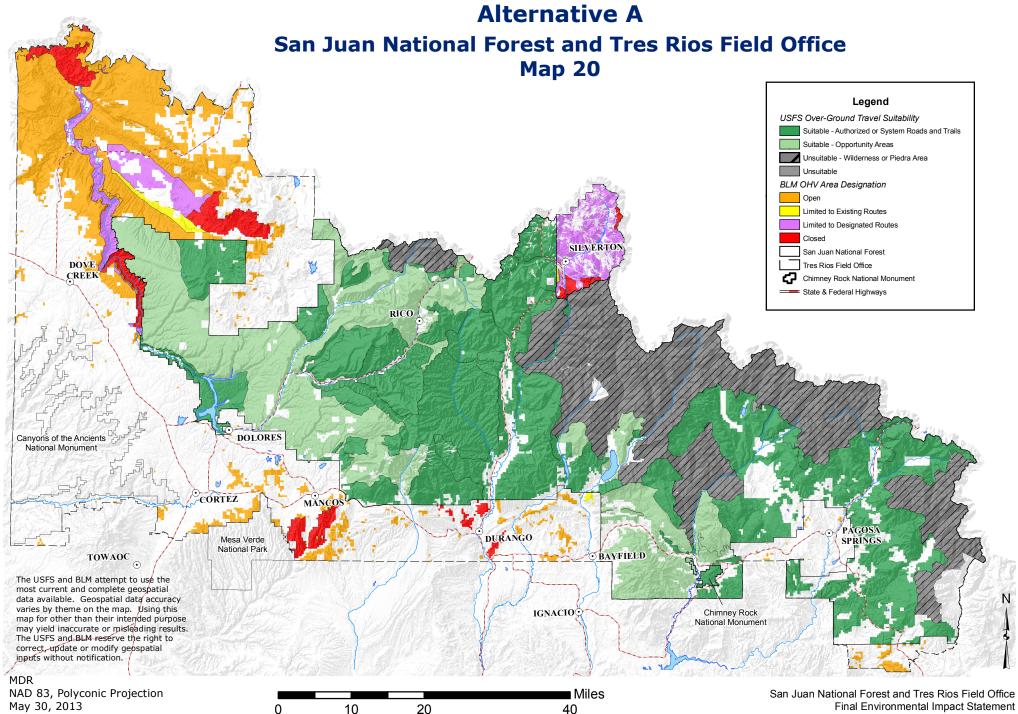


# Wildfire Occurrence 1980-2011

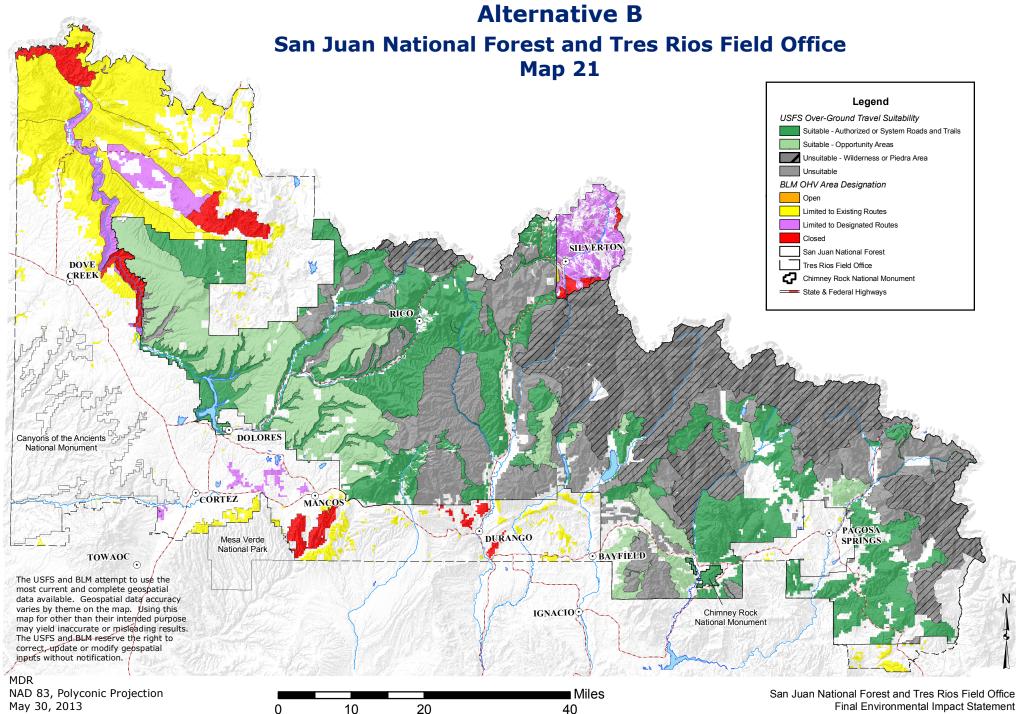




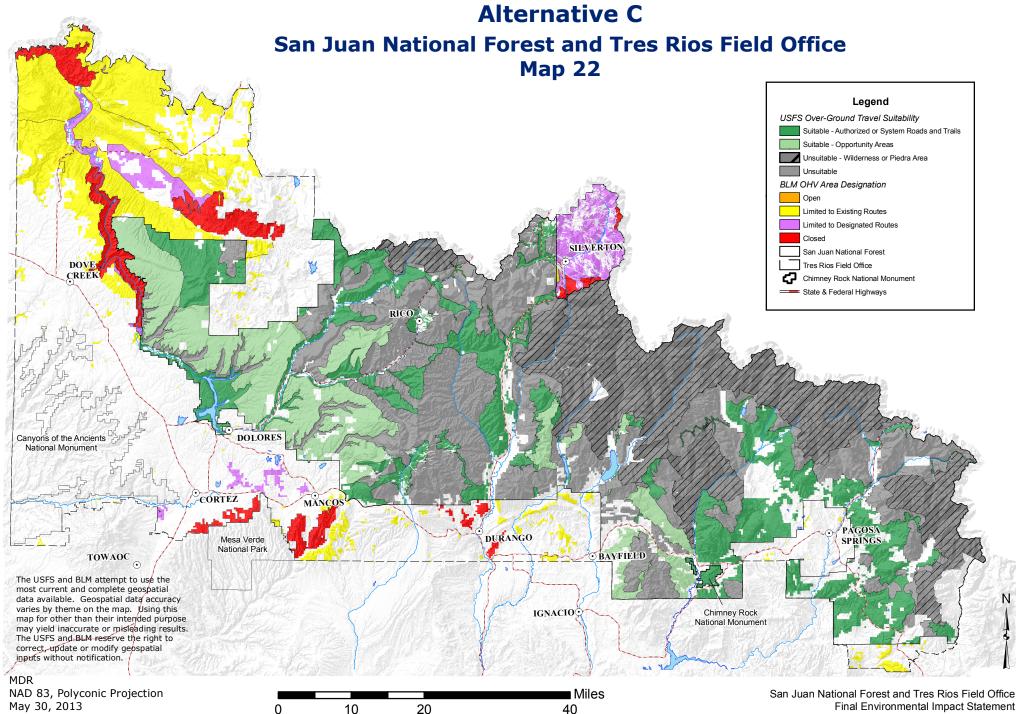
## Over-Ground Travel Suitability and OHV Area Designations



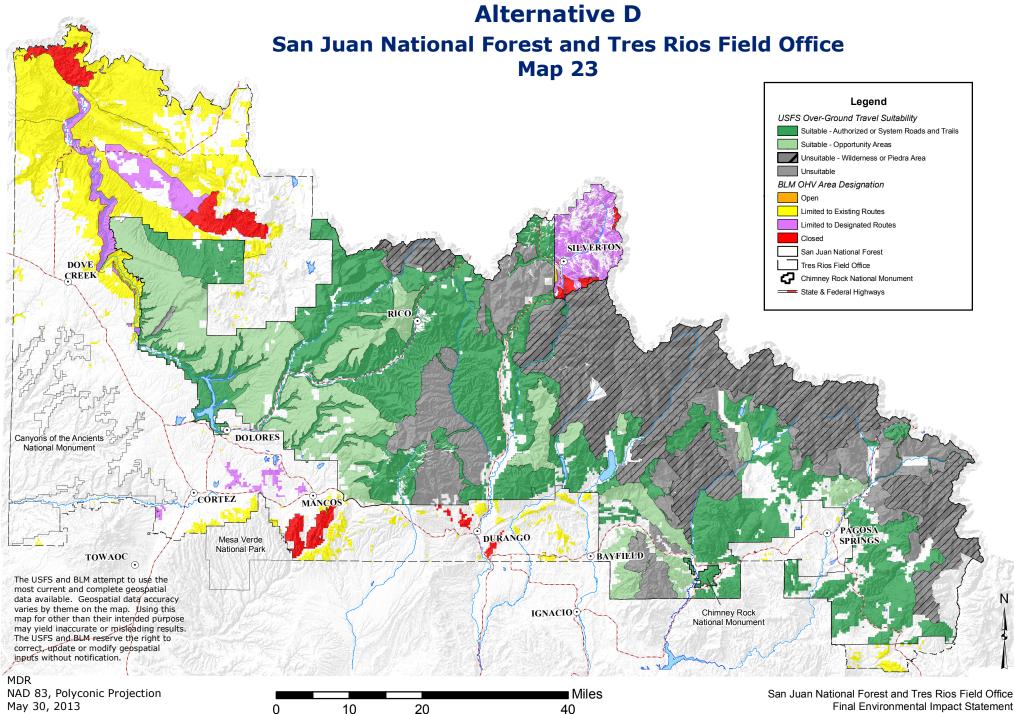
## Over-Ground Travel Suitability and OHV Area Designations Alternative B



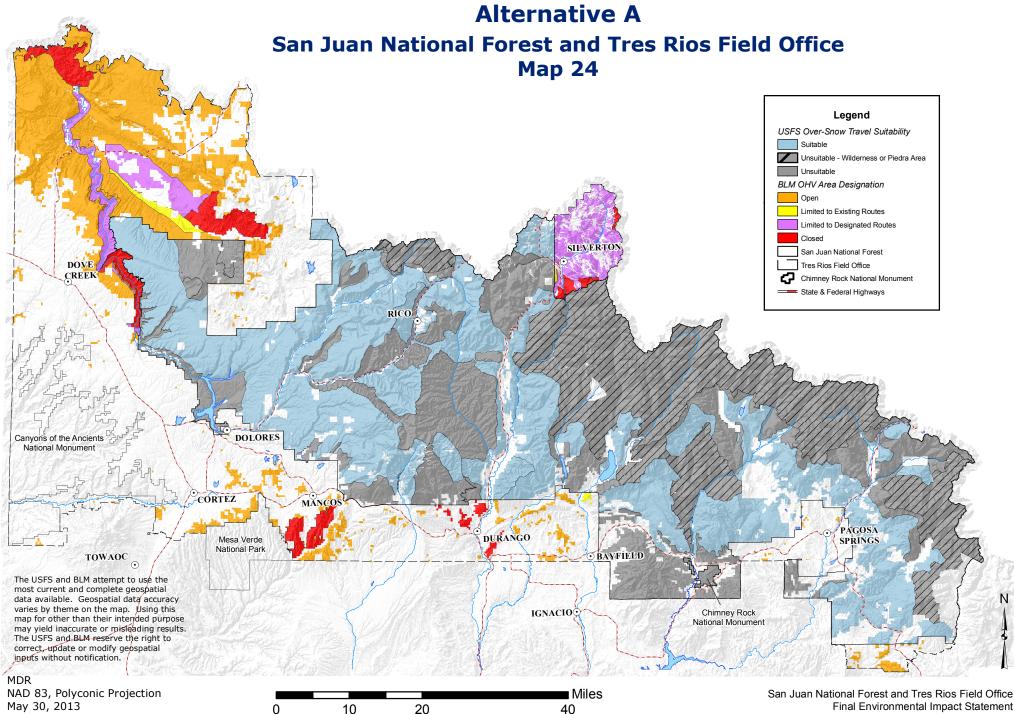
## Over-Ground Travel Suitability and OHV Area Designations



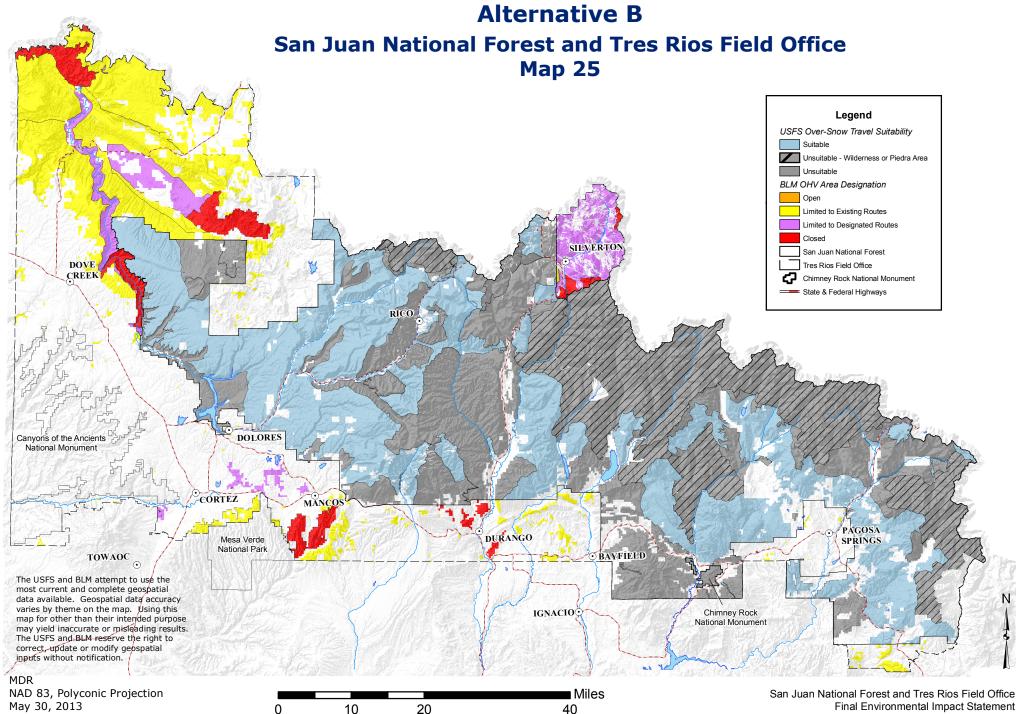
## Over-Ground Travel Suitability and OHV Area Designations Alternative D



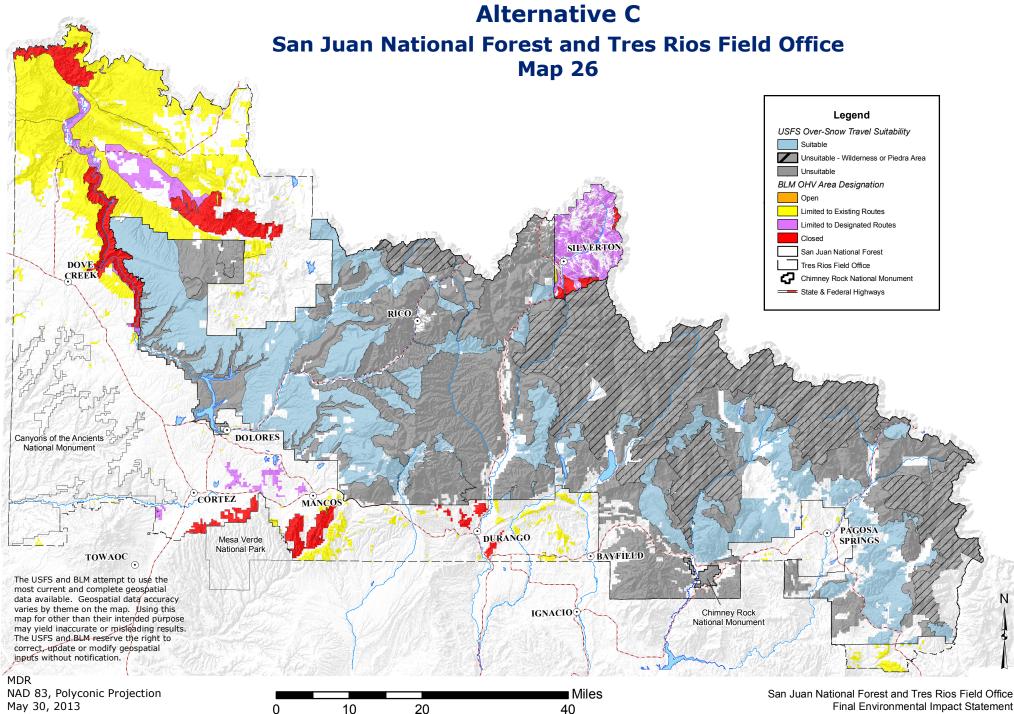
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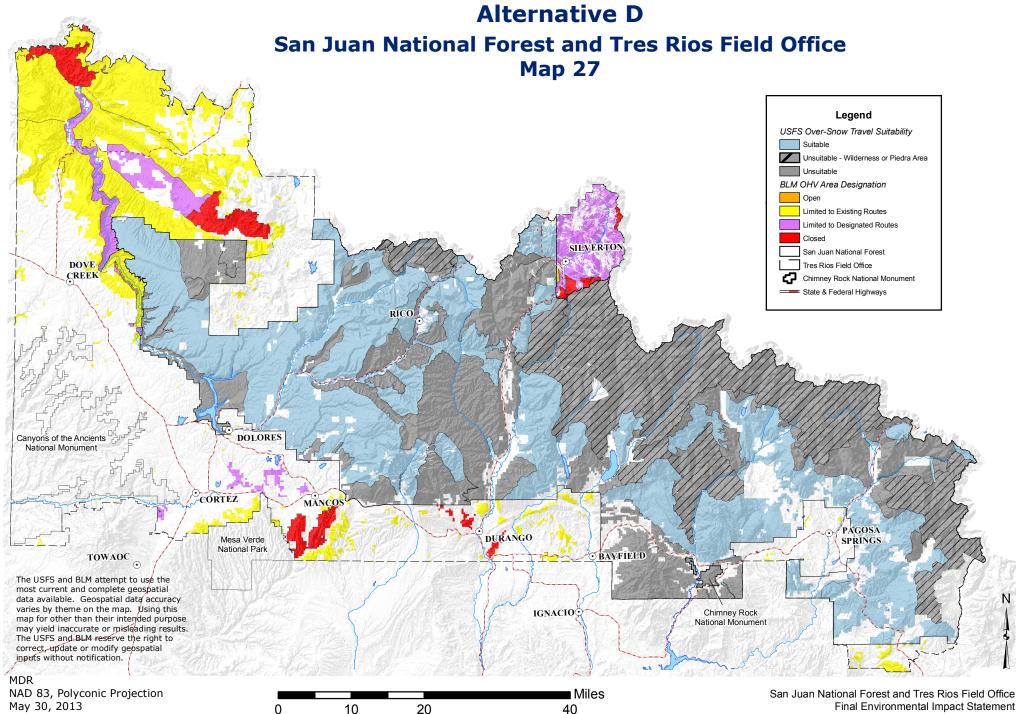
## Over-Snow Travel Suitability and OHV Area Designations Alternative B

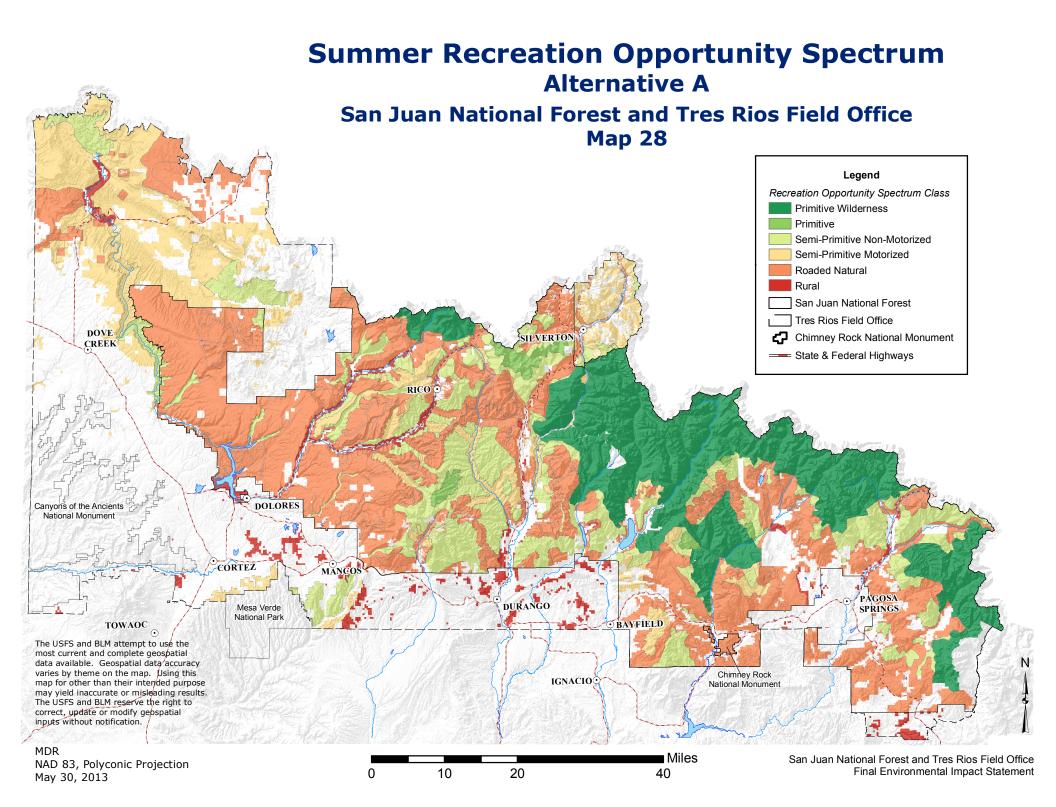


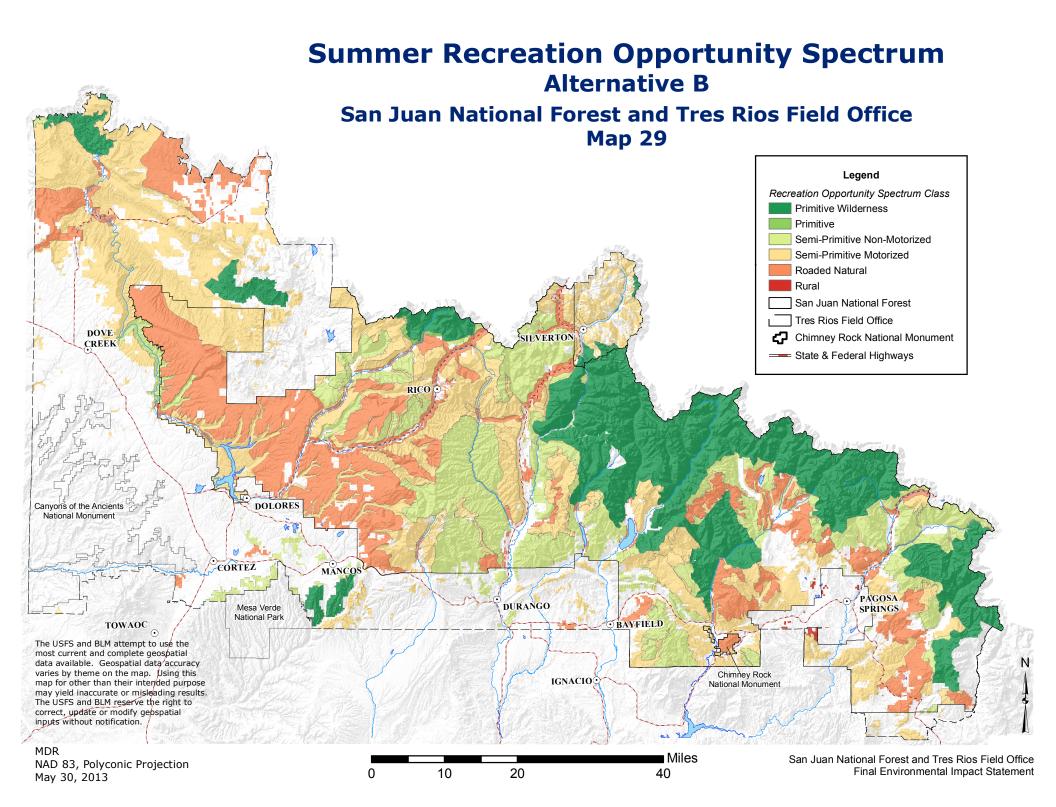
## Over-Snow Travel Suitability and OHV Area Designations Alternative C

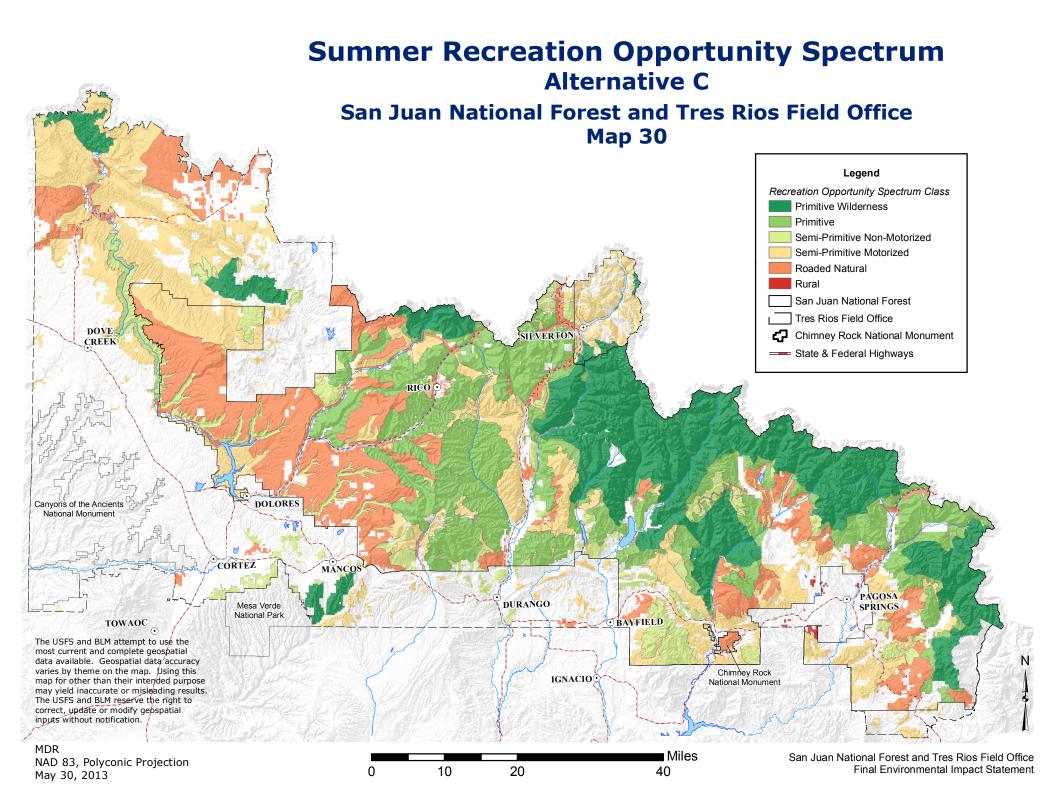


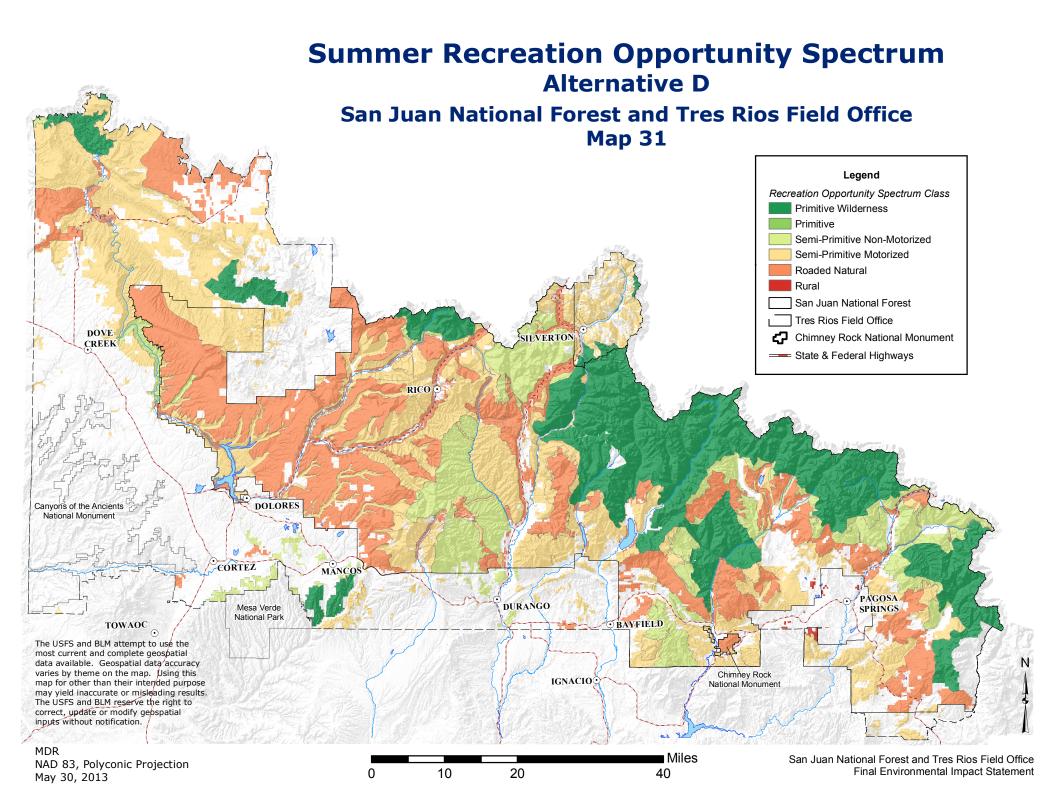
## Over-Snow Travel Suitability and OHV Area Designations Alternative D

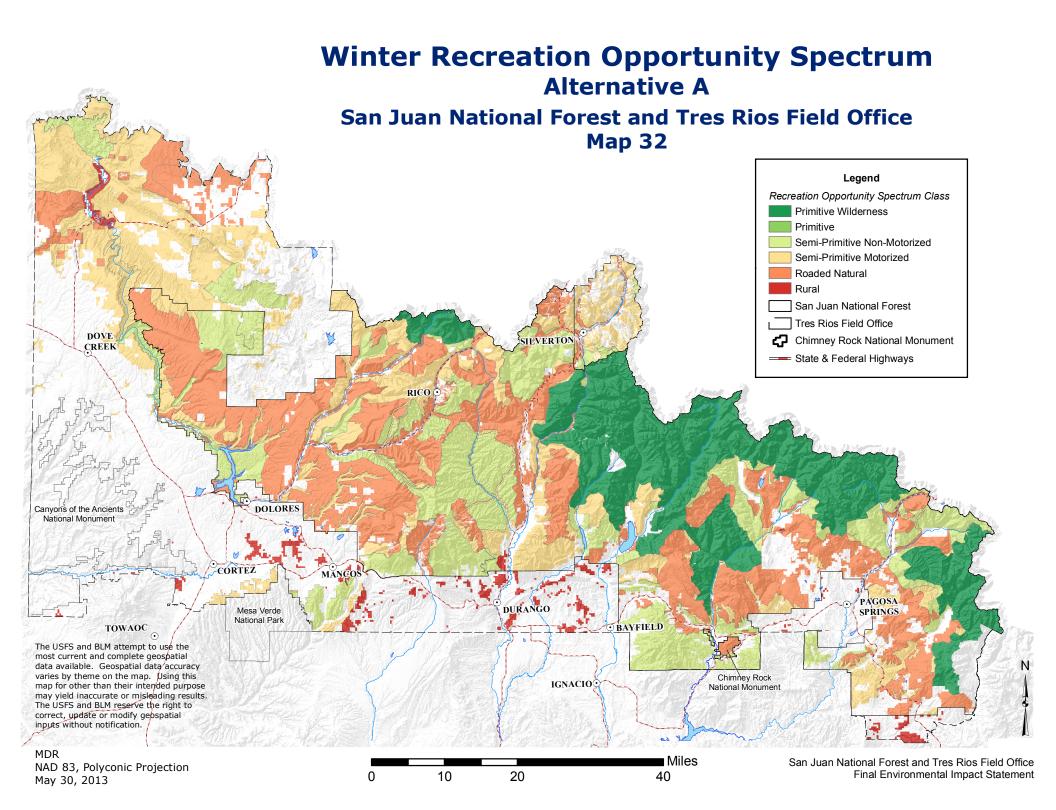


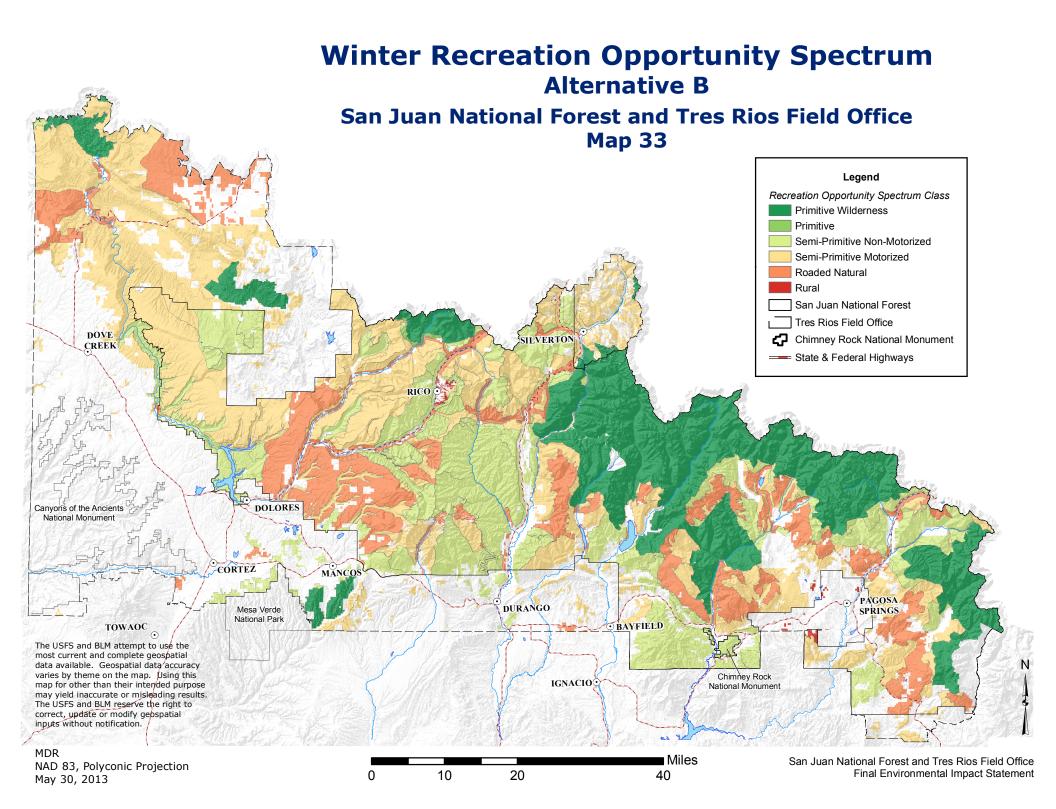


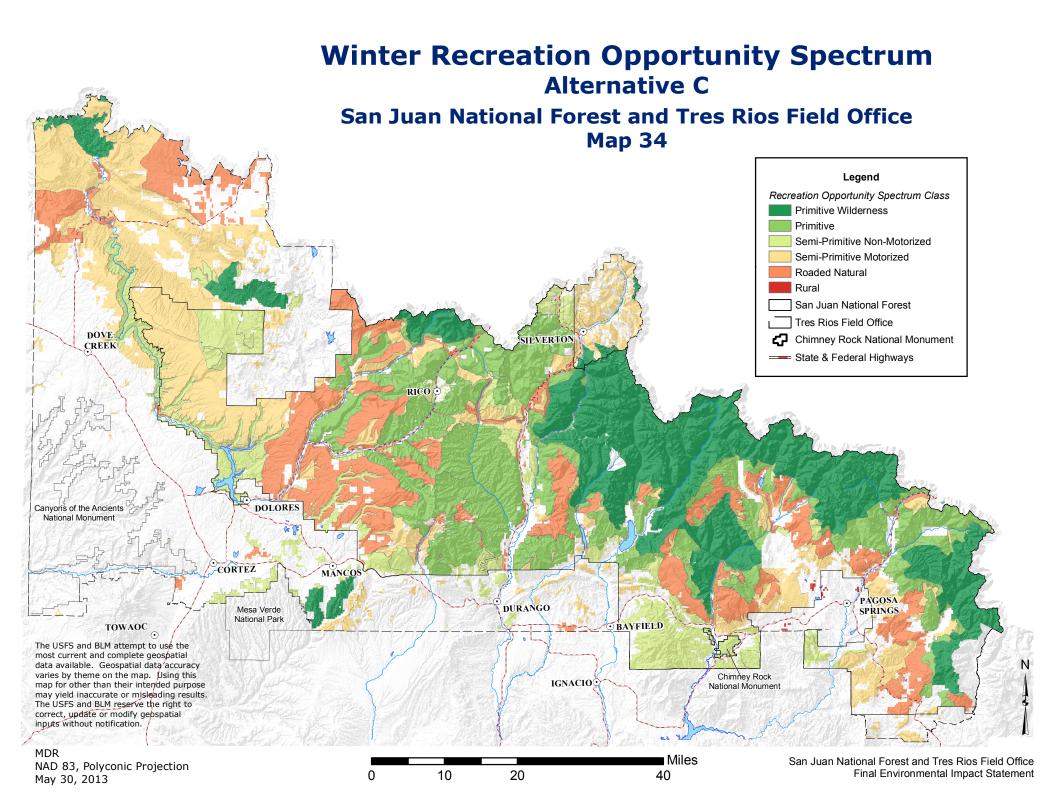


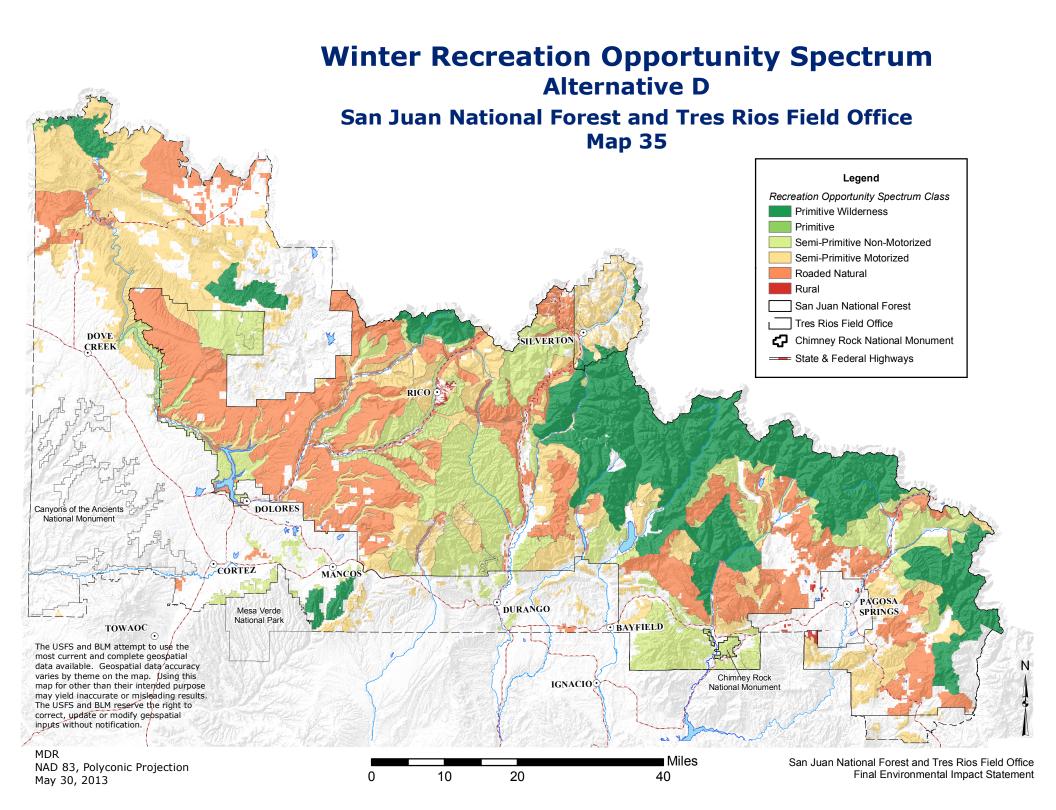


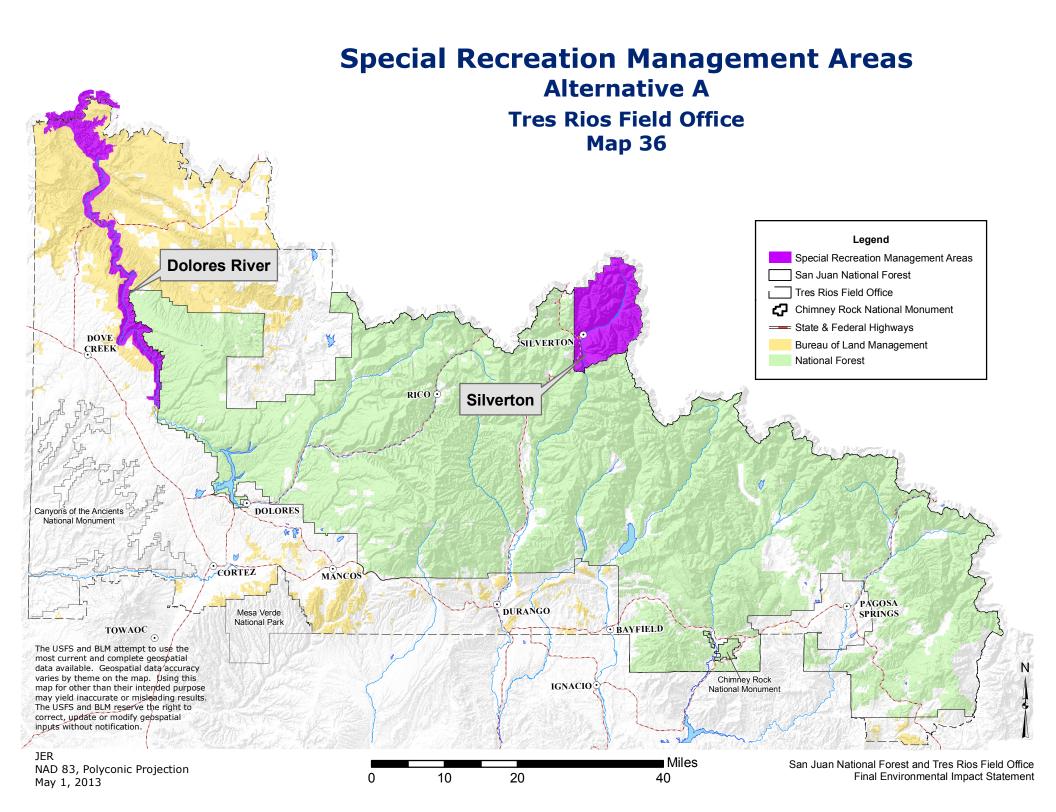


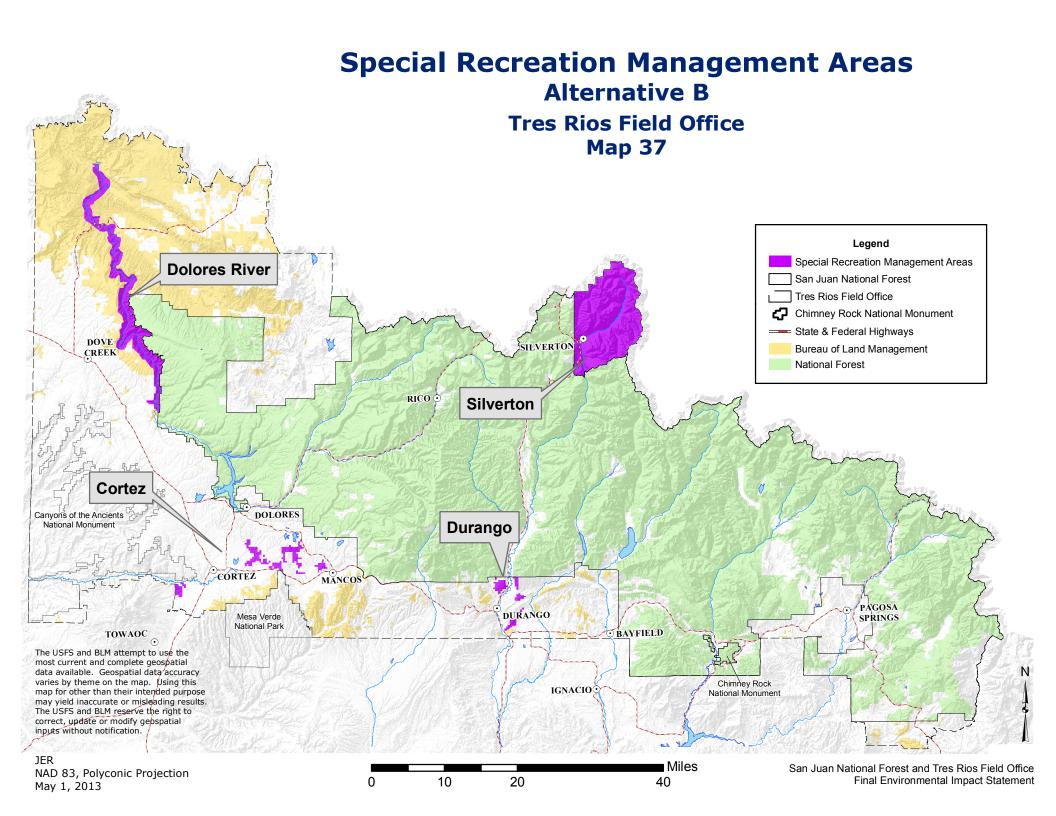


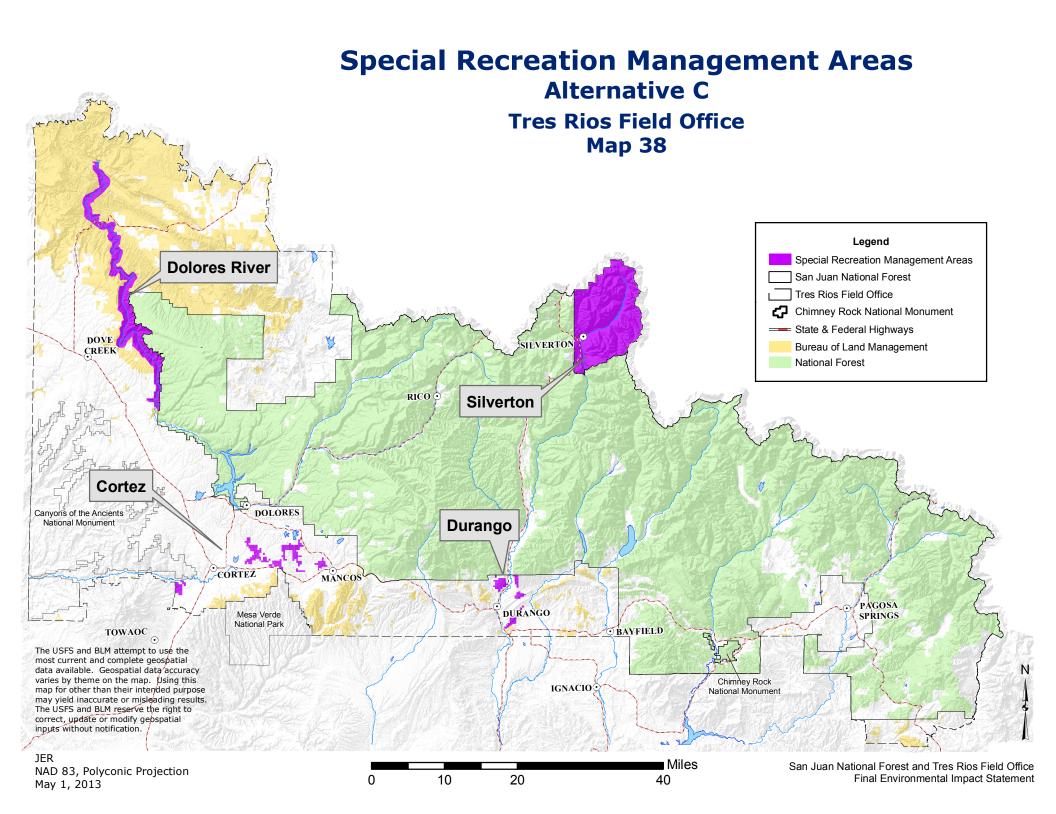


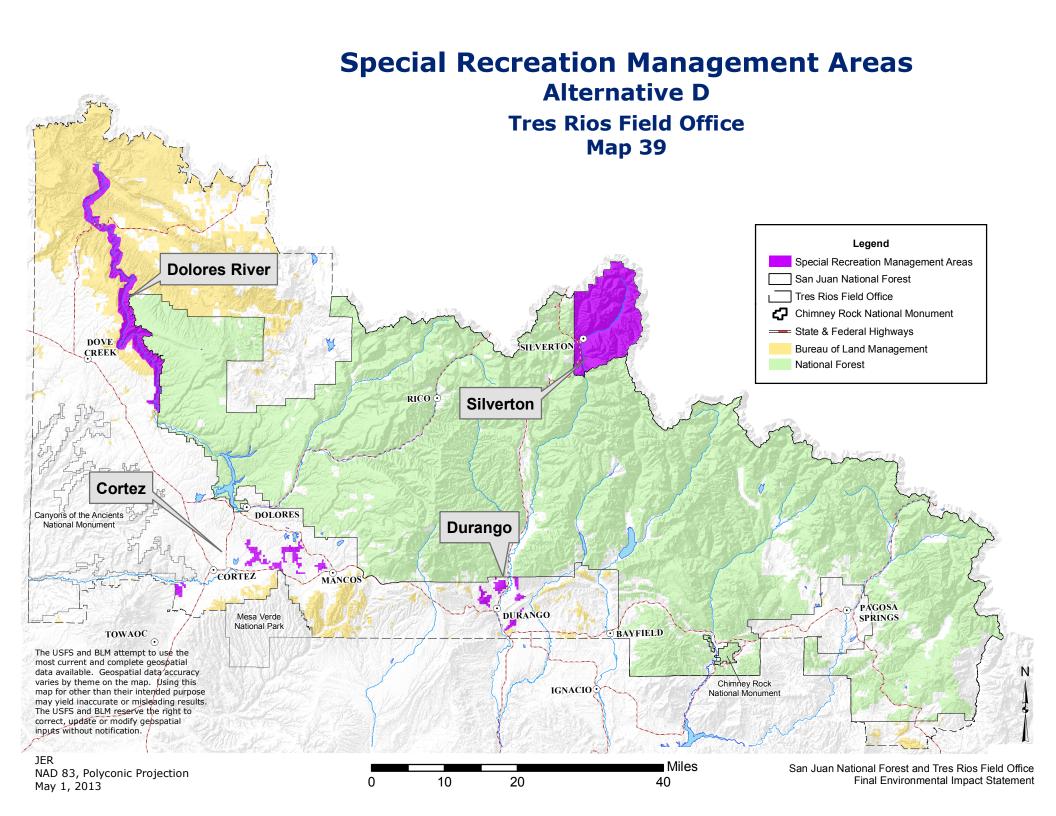


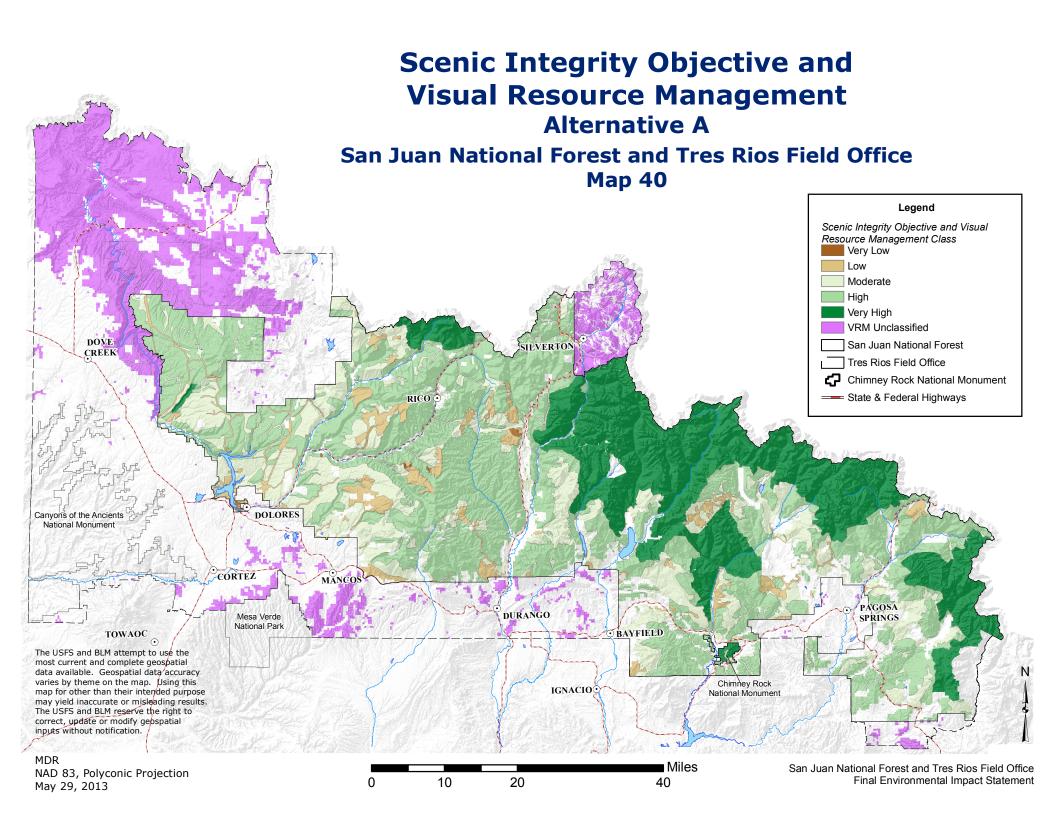


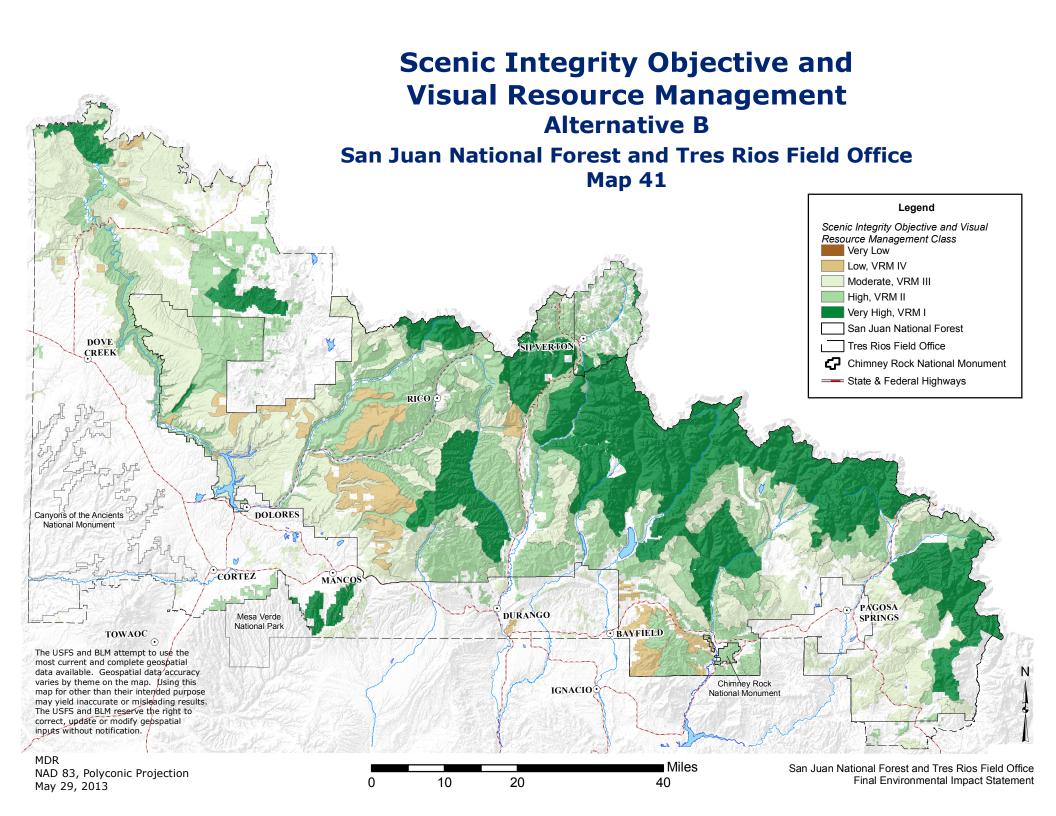


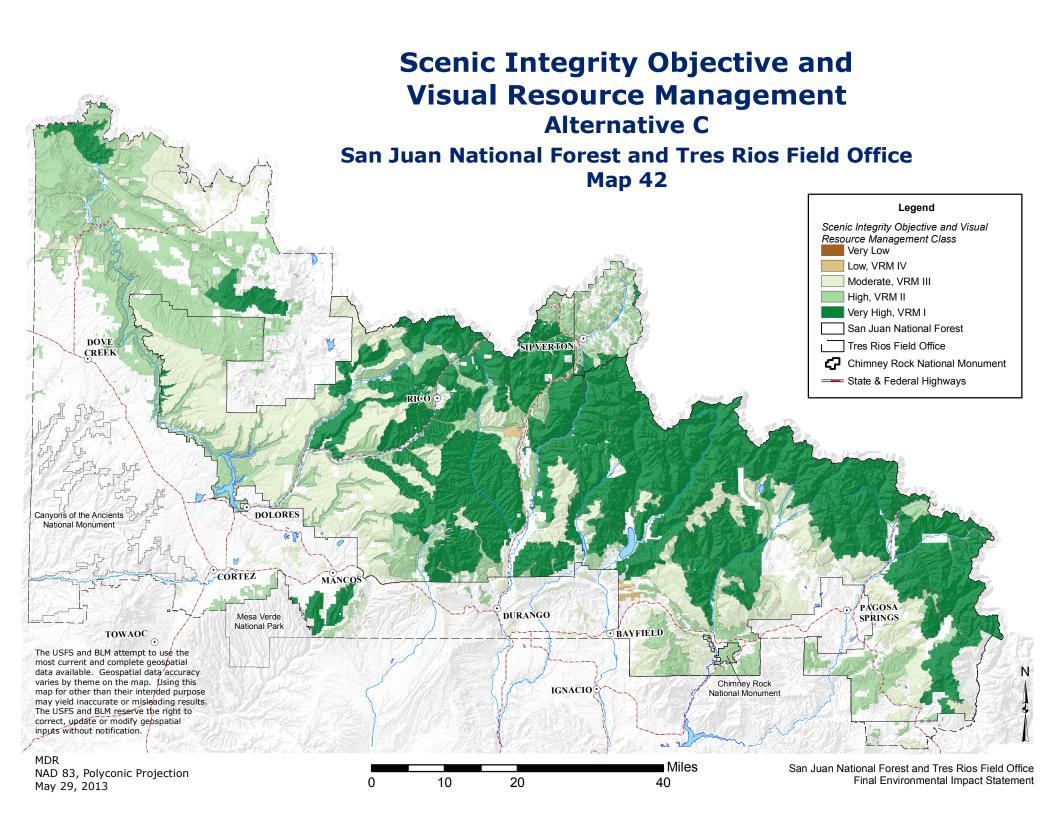


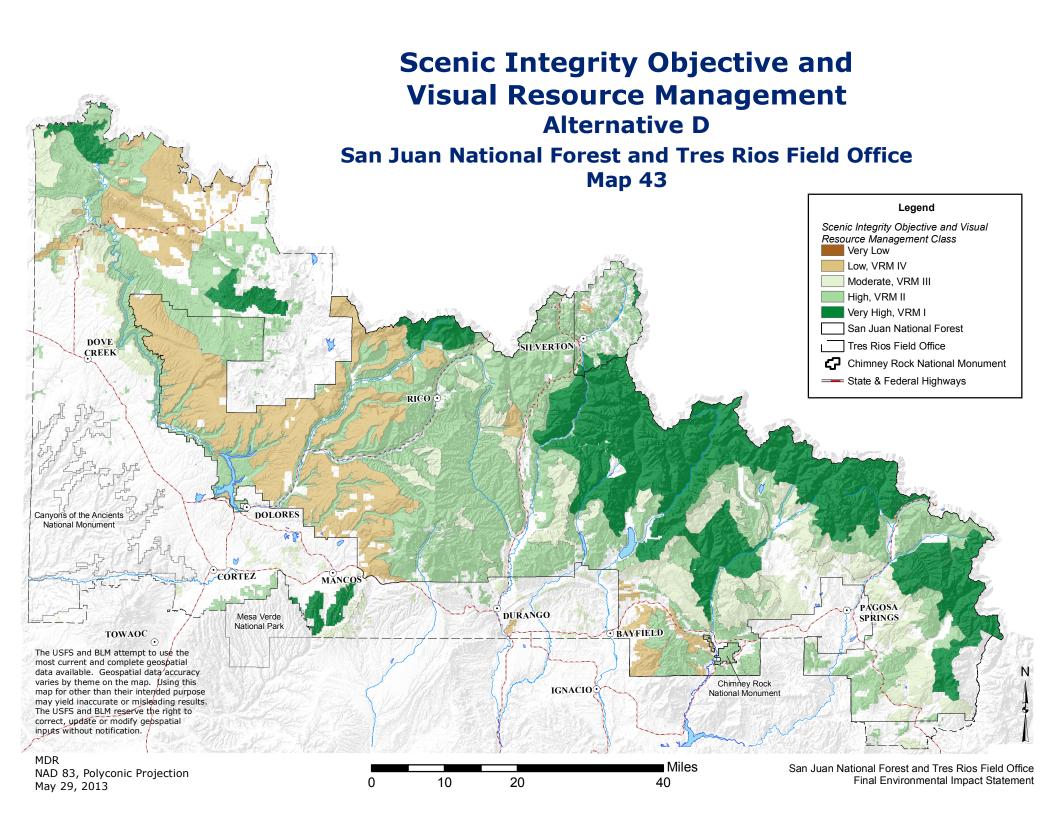


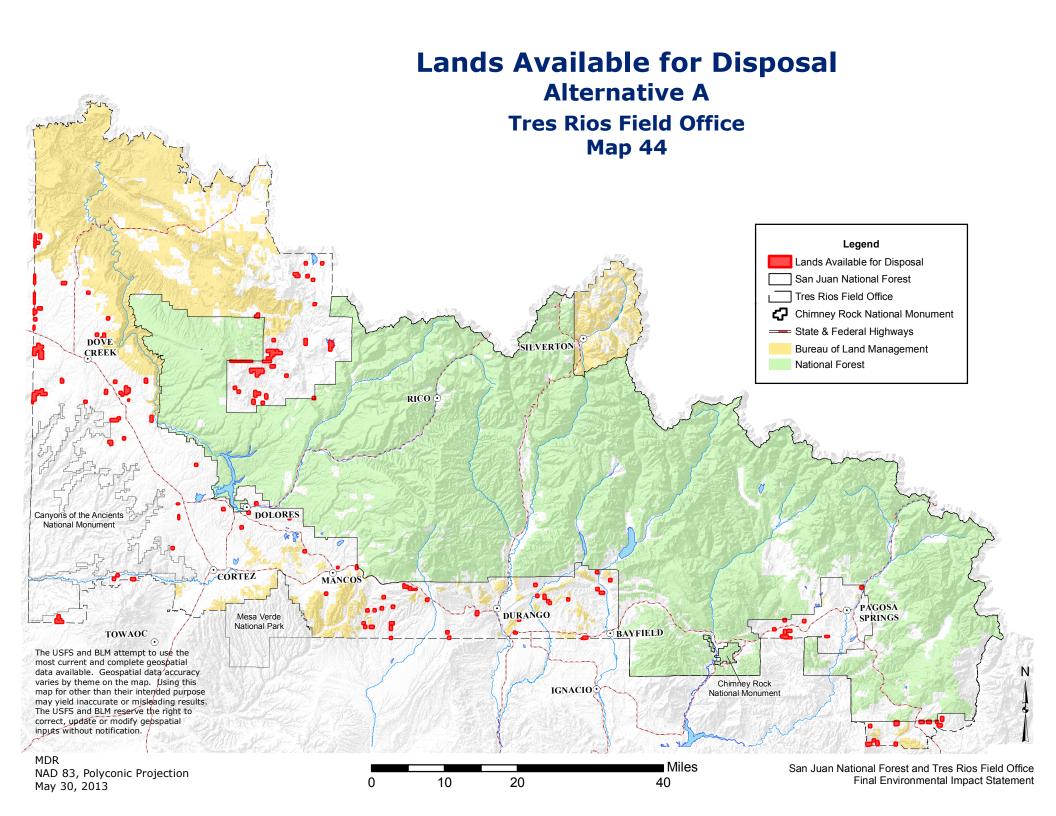


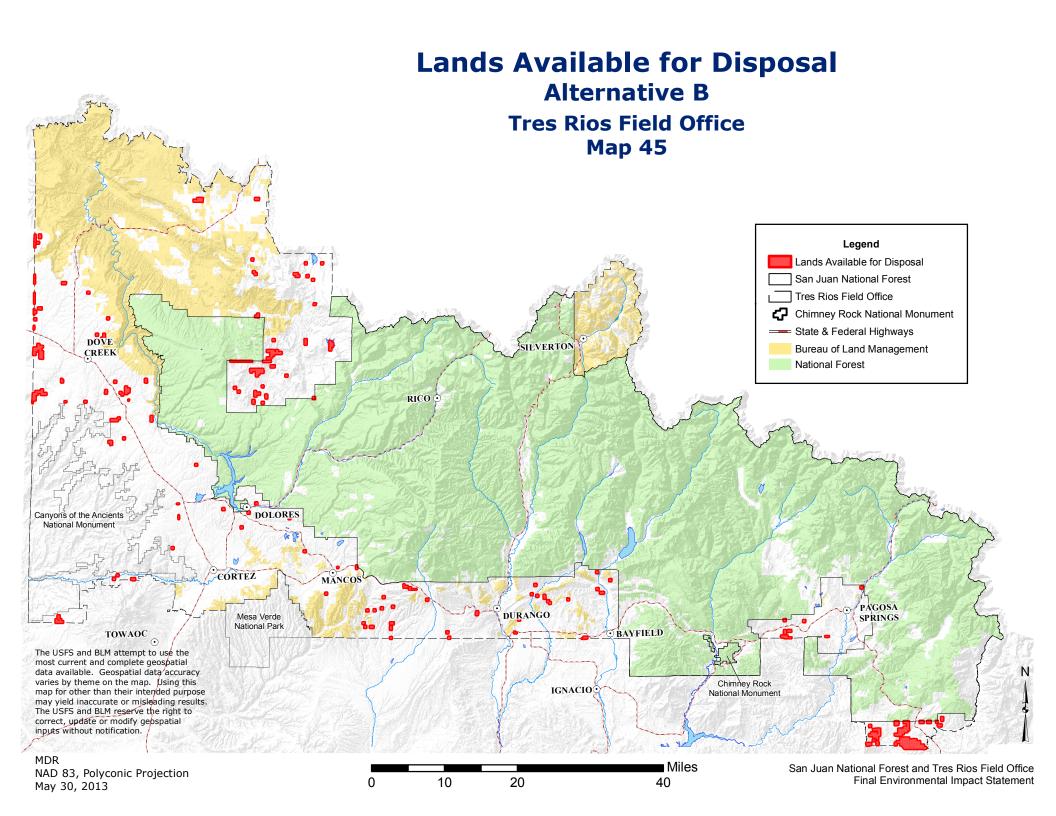


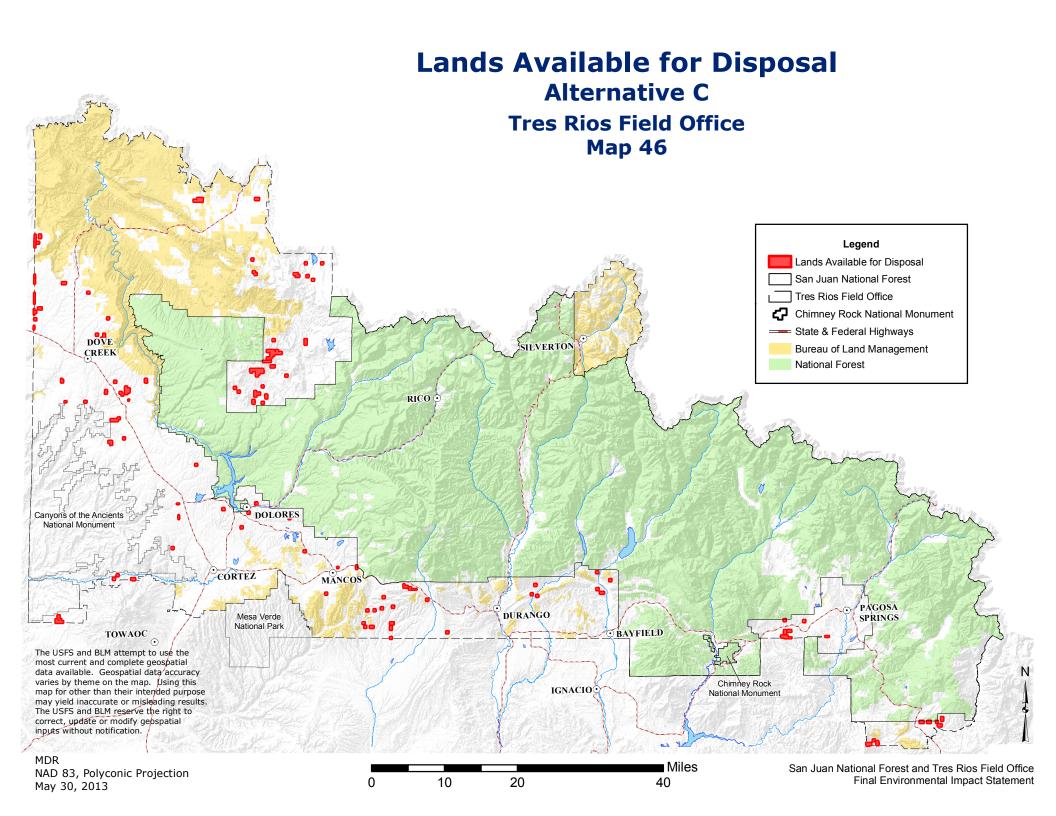


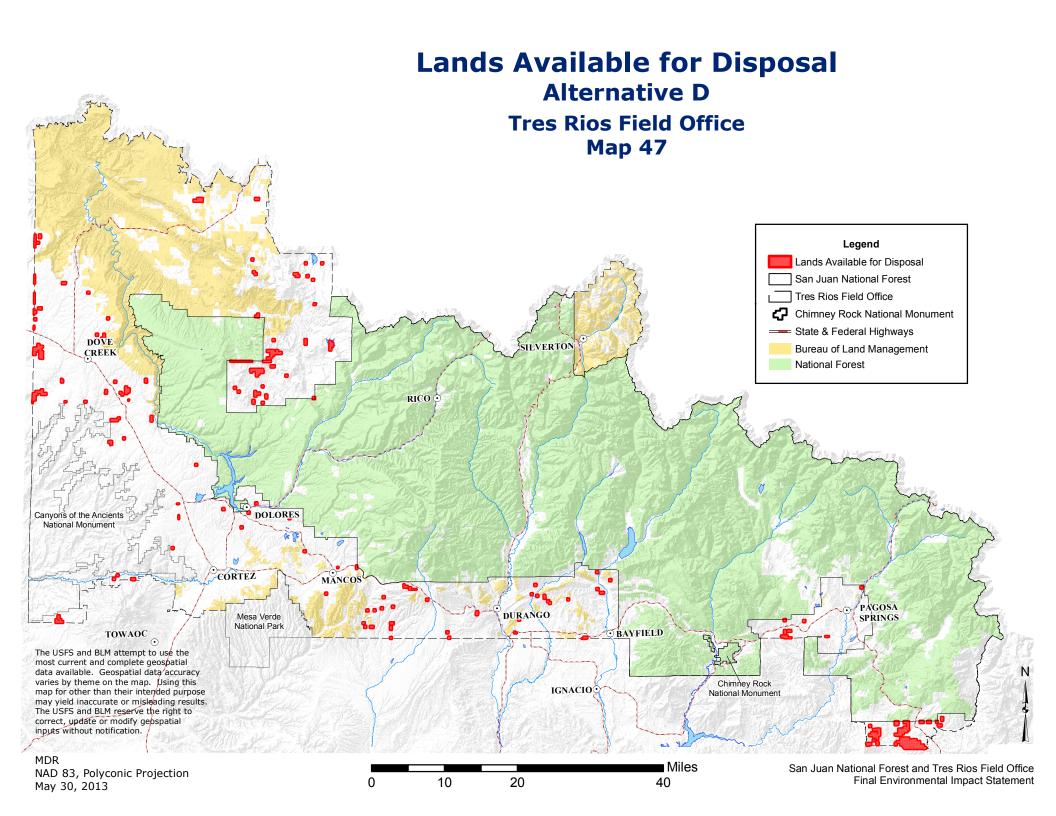


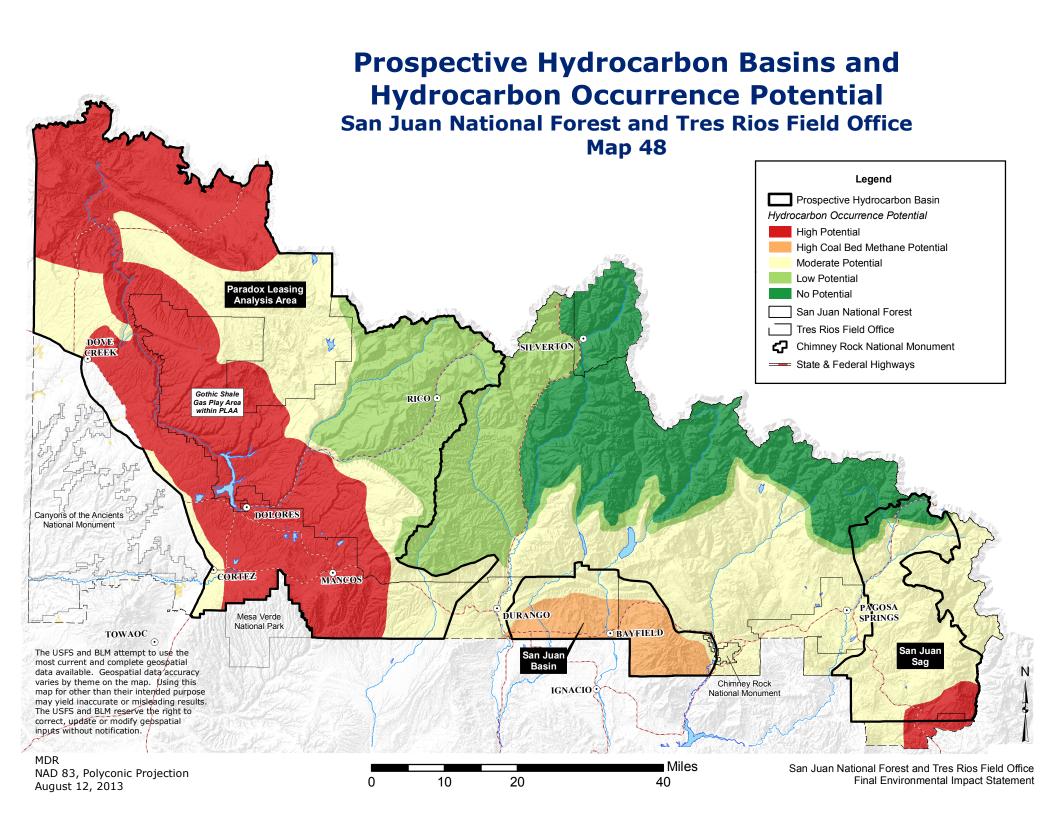


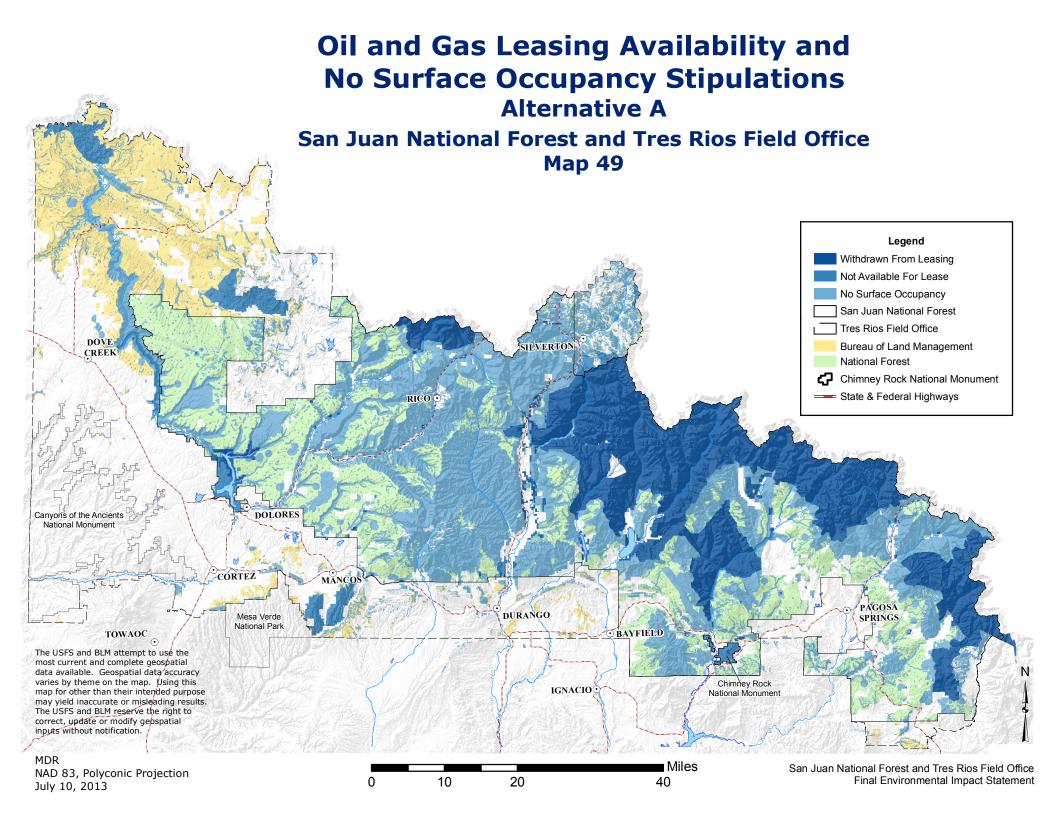


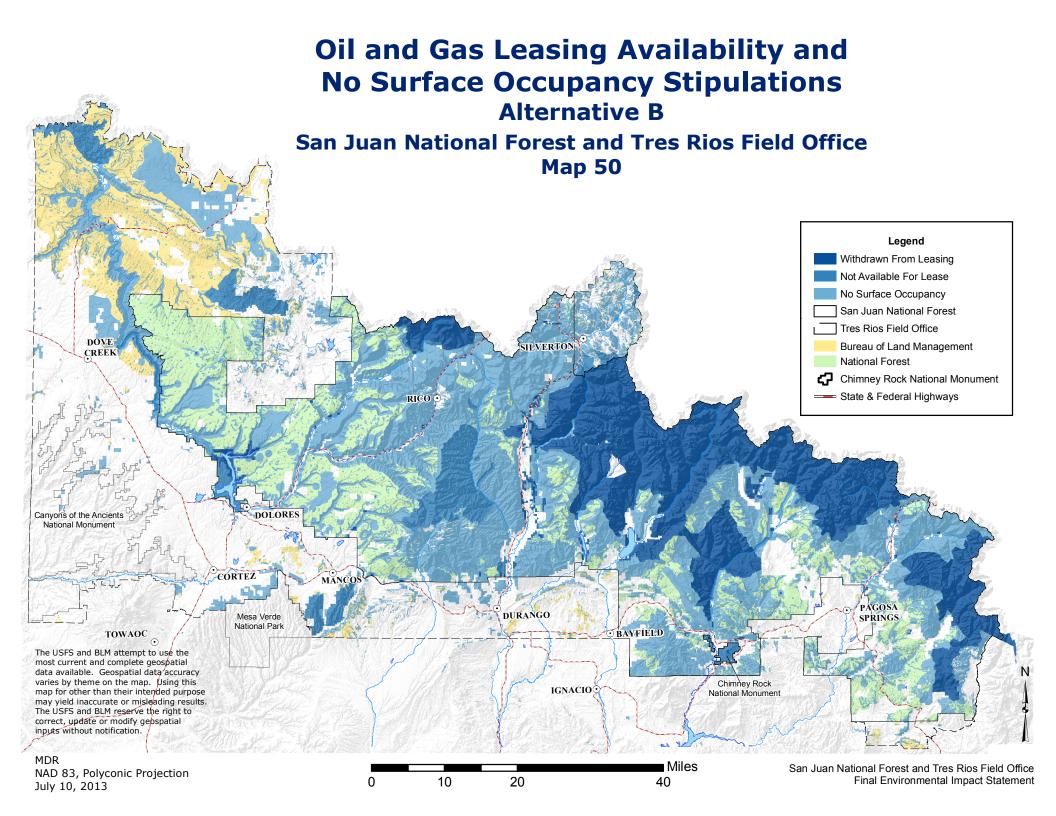


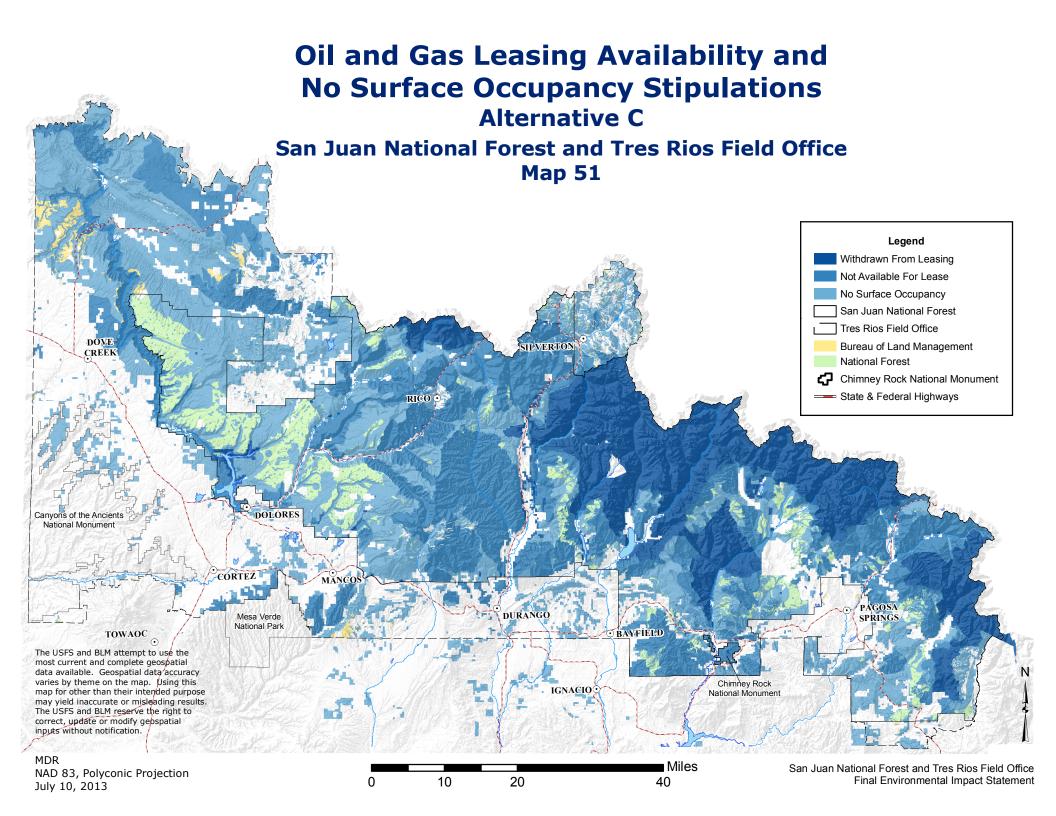


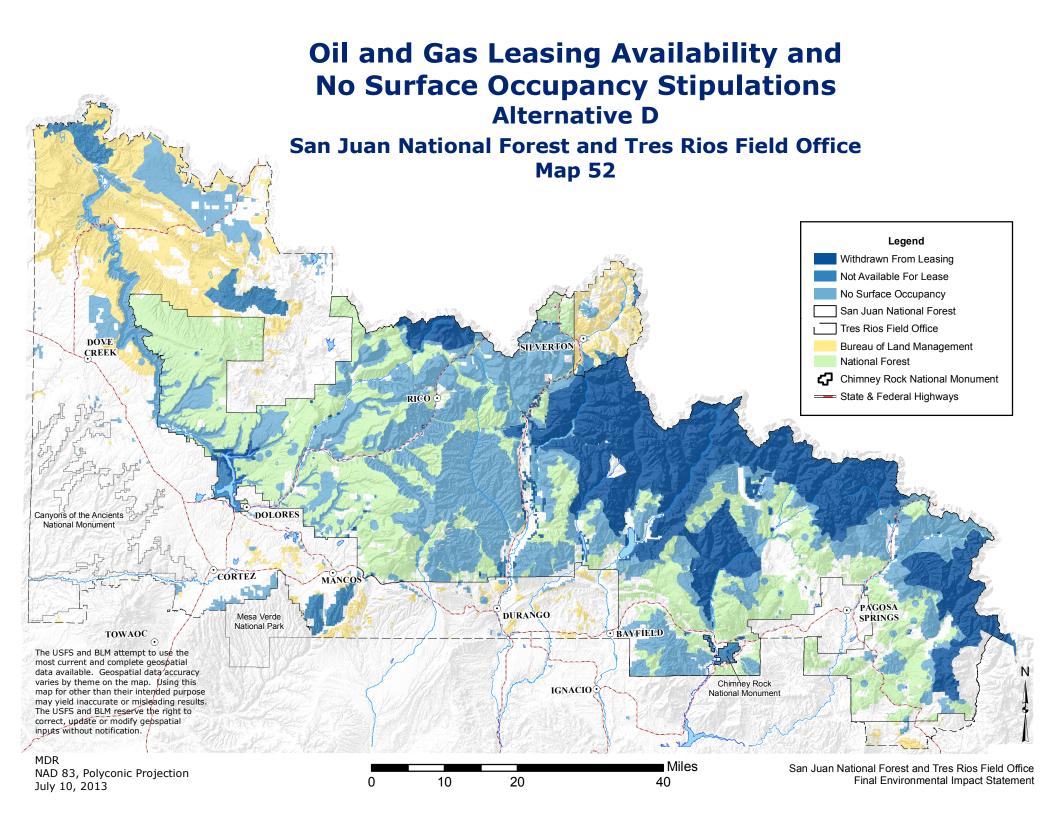


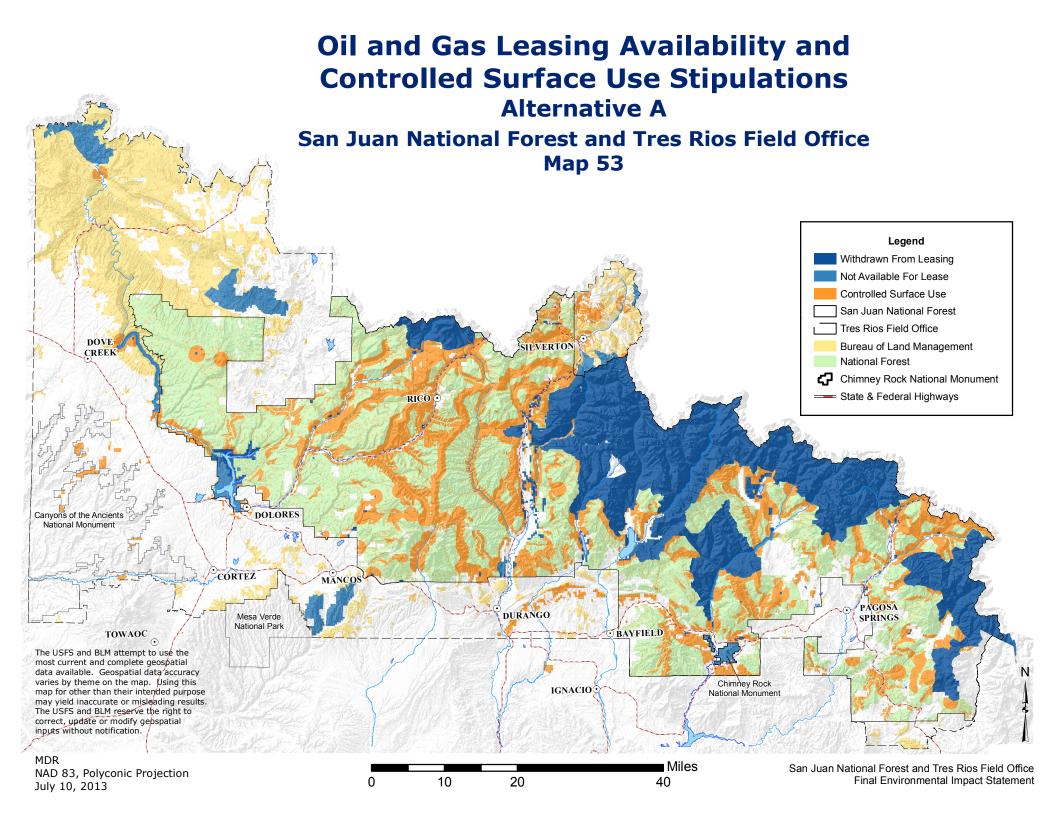


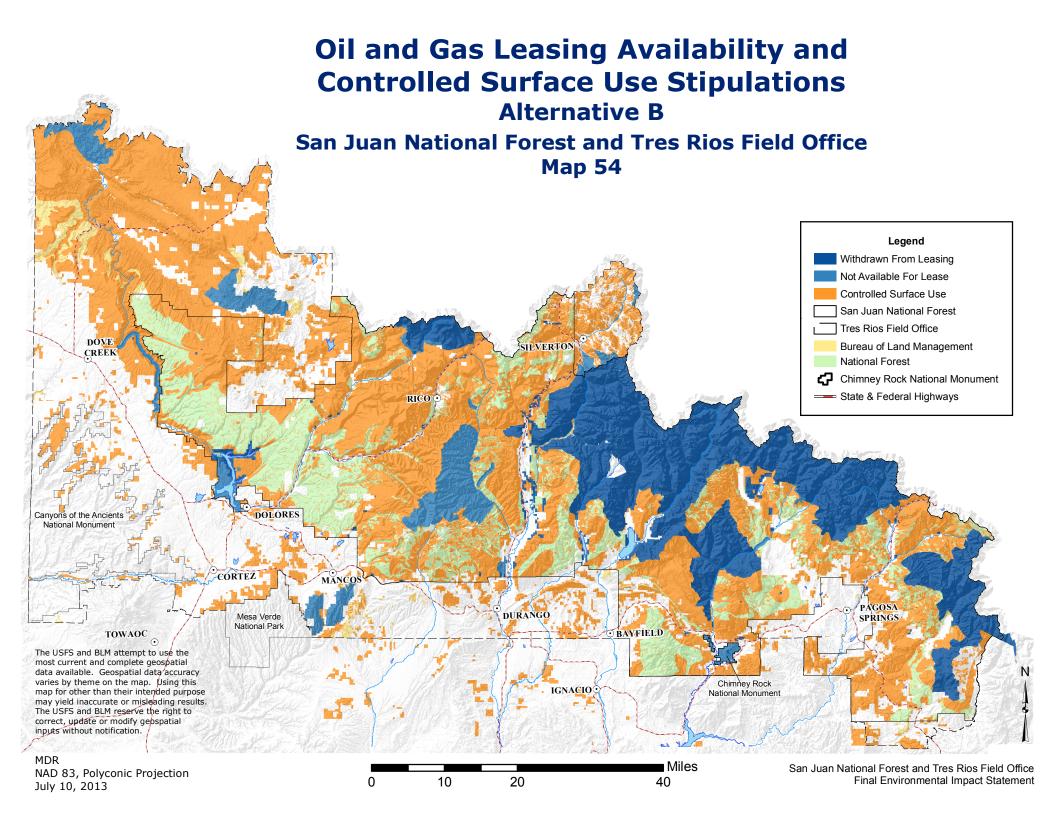


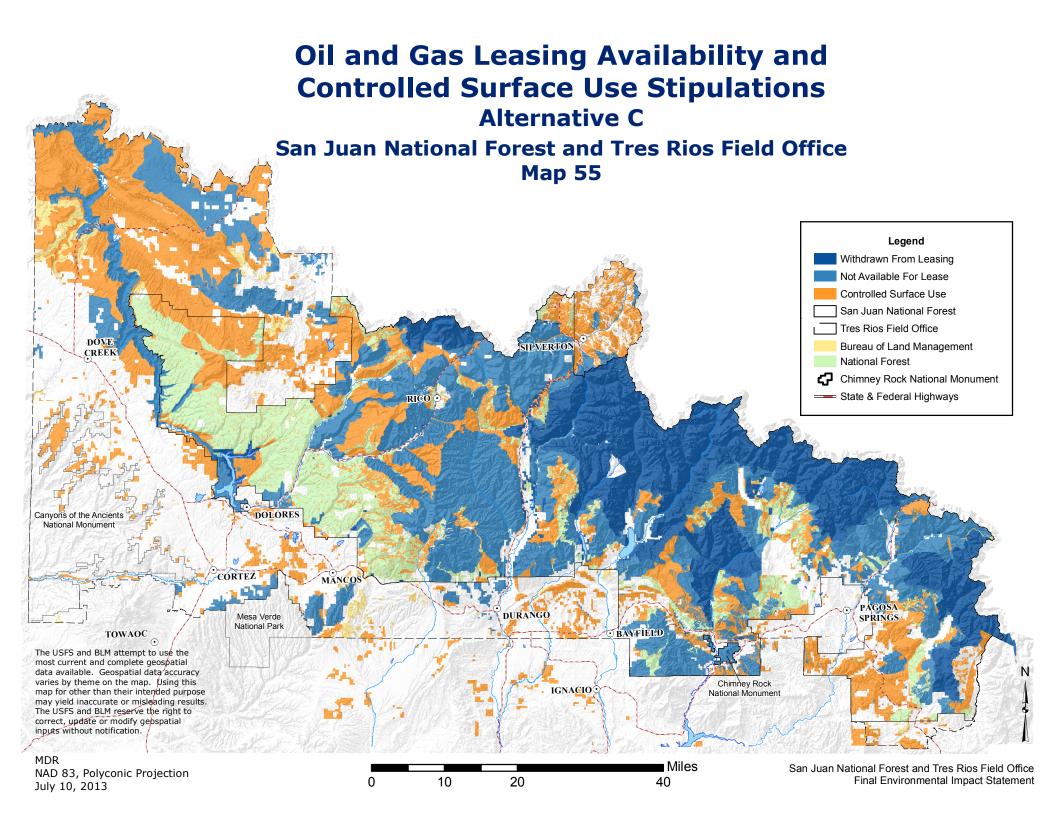


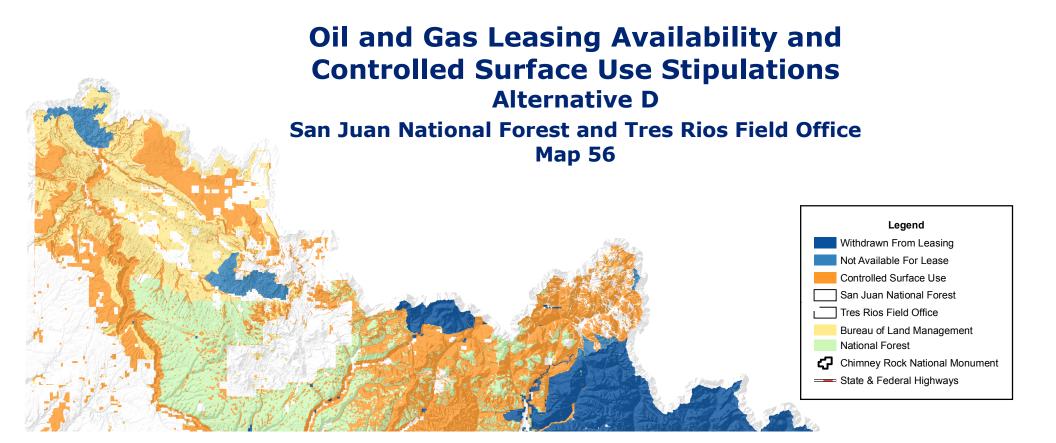






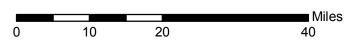


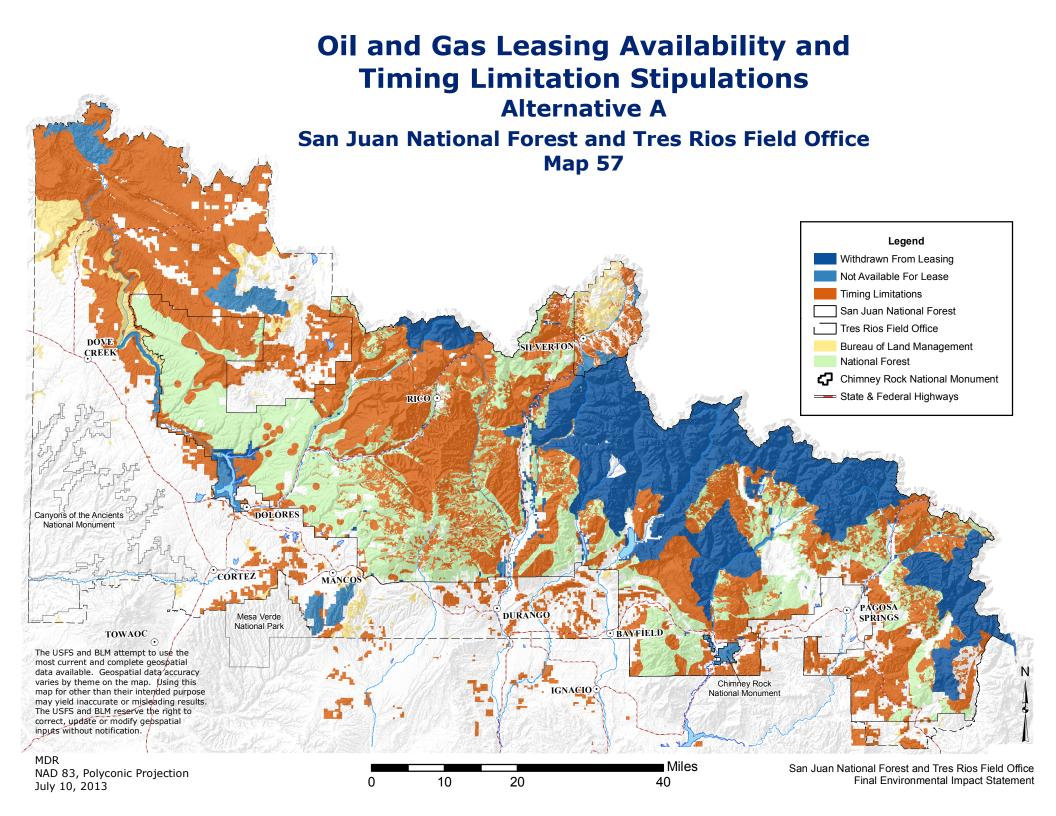


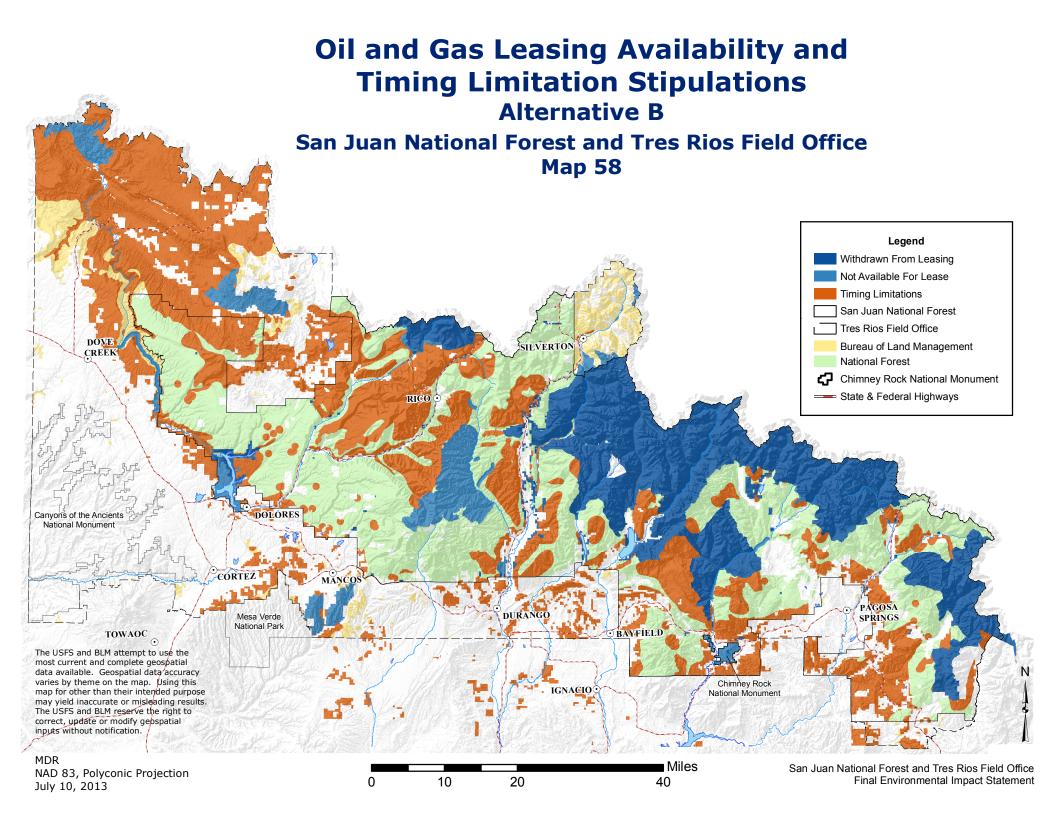


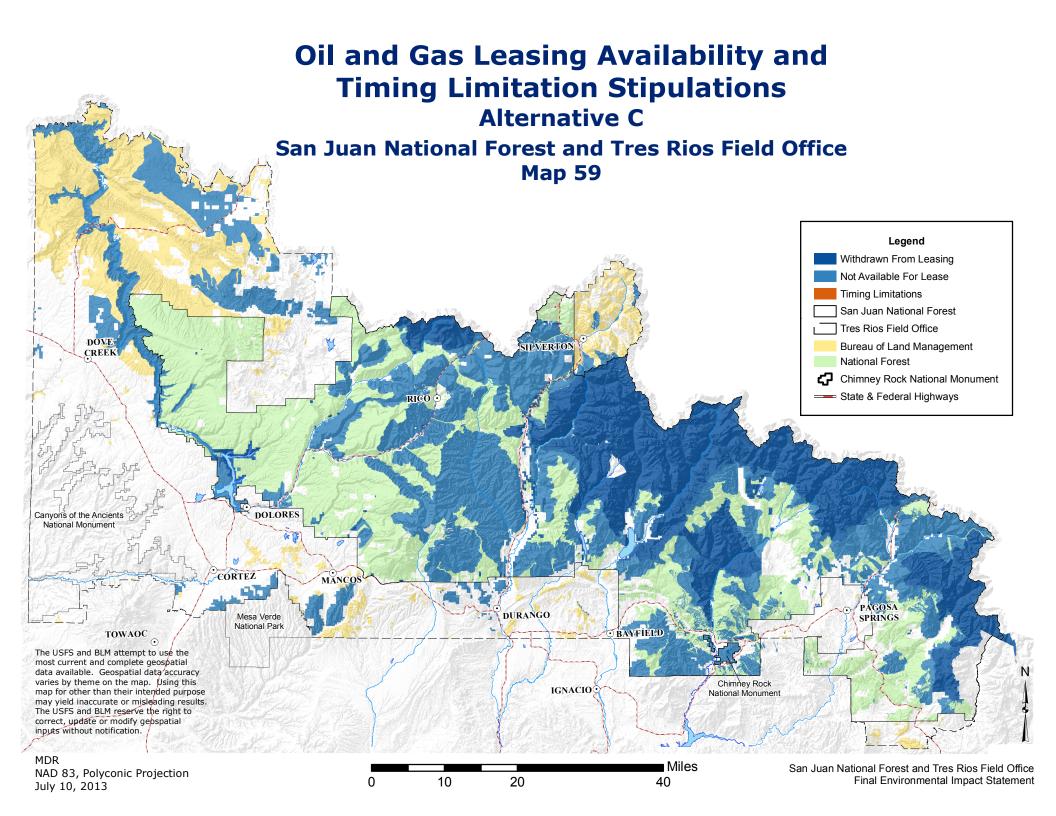
The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

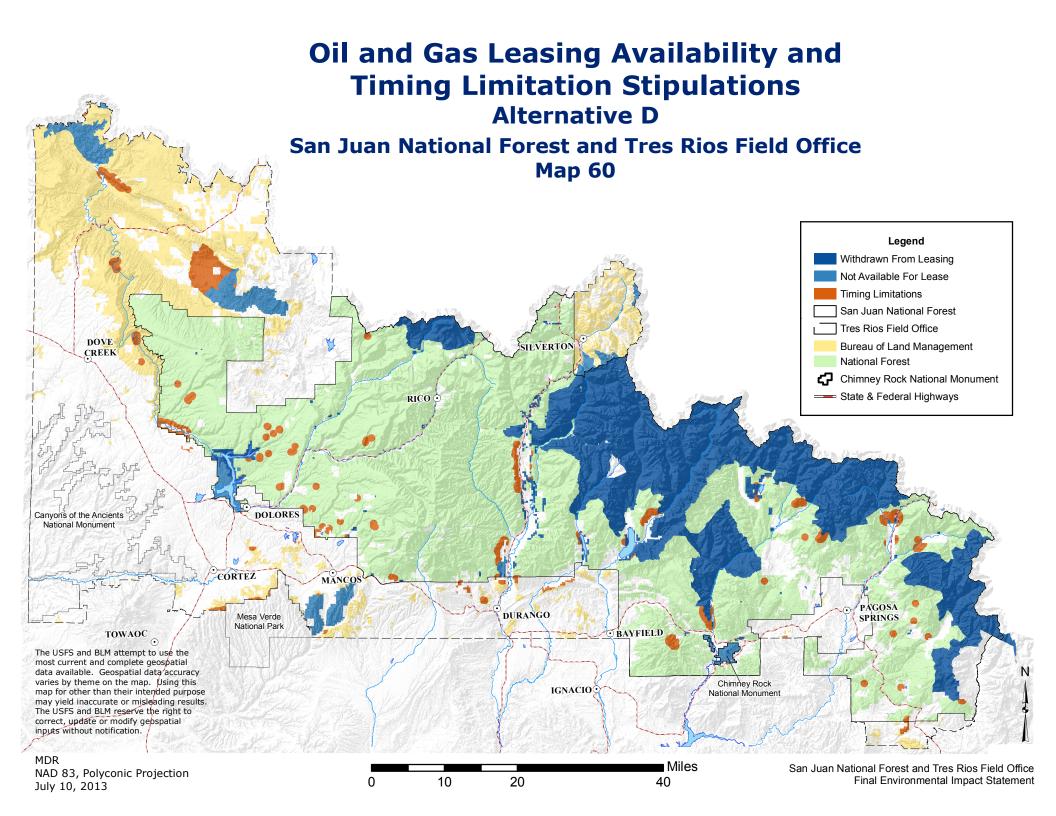
MDR NAD 83, Polyconic Projection July 10, 2013

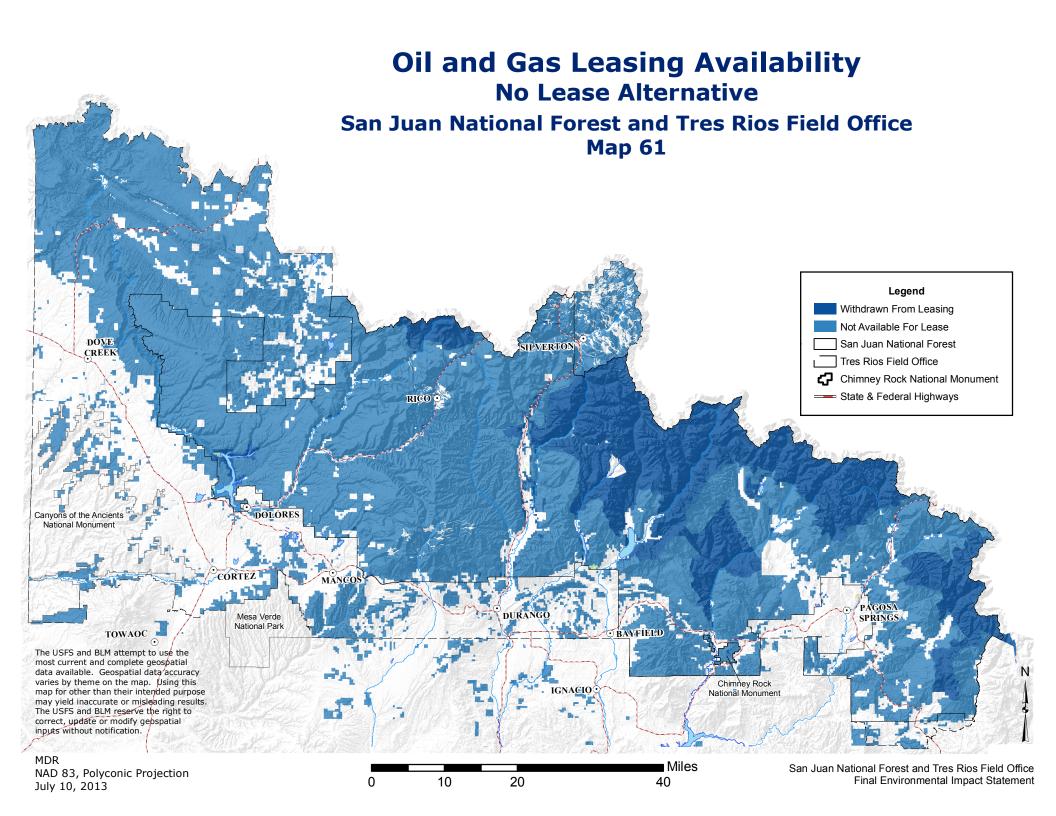




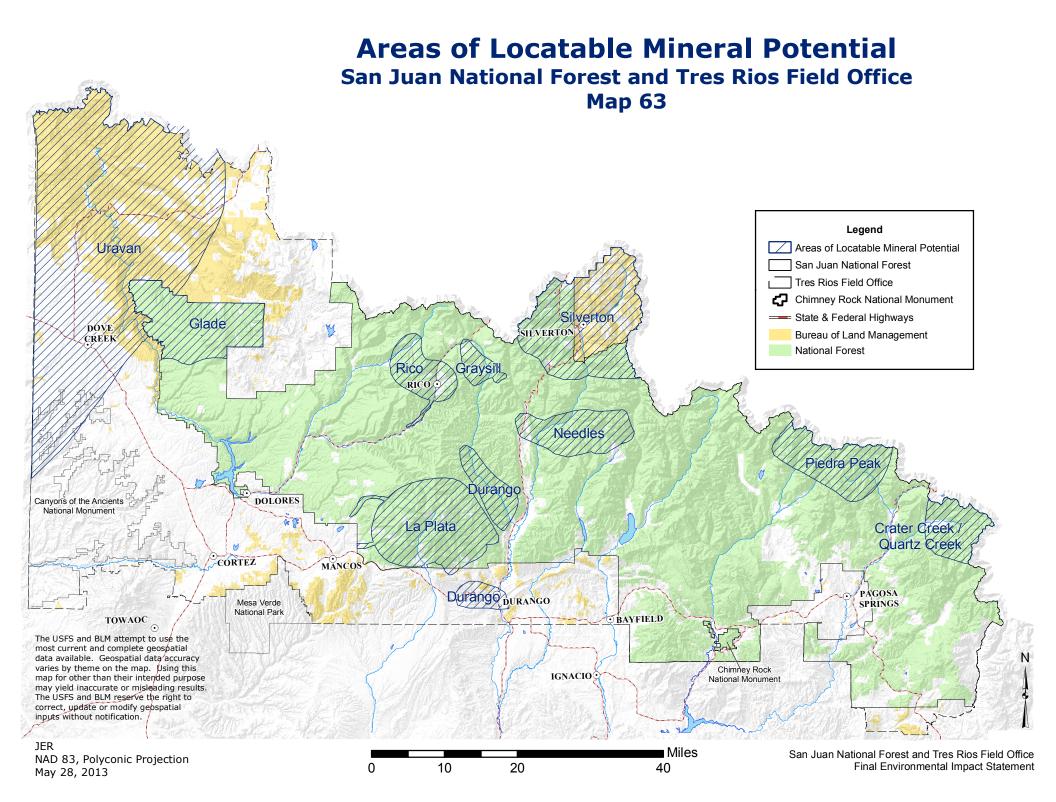


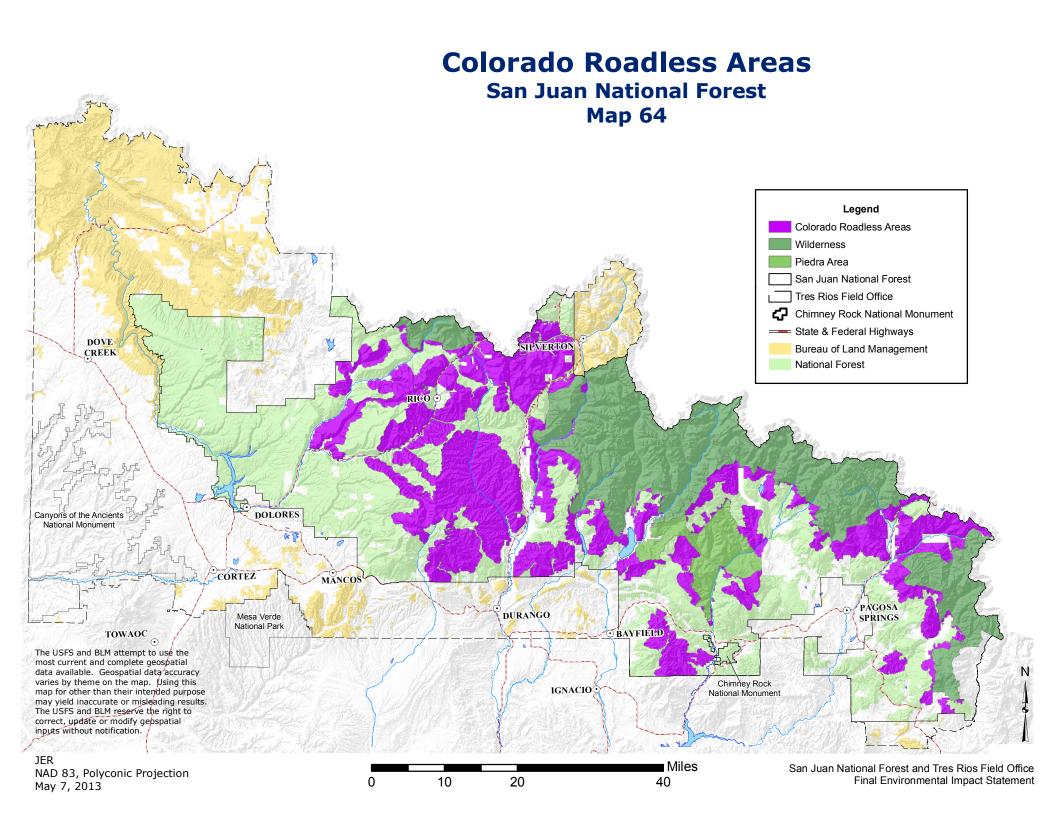


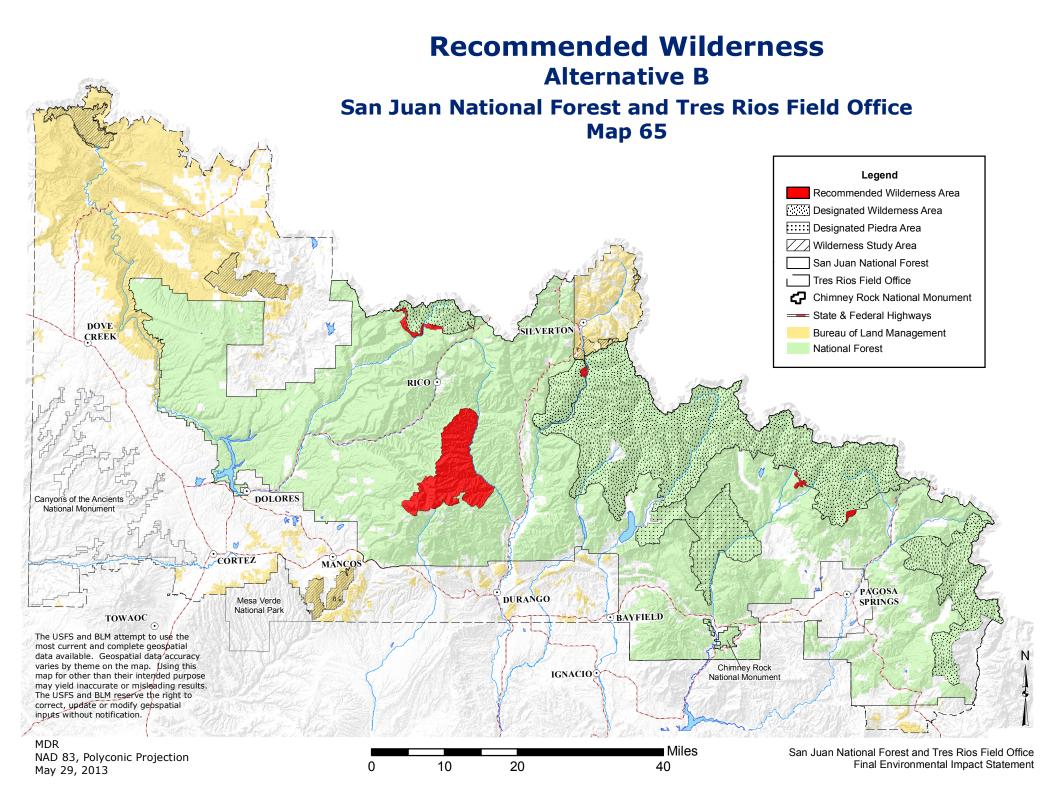


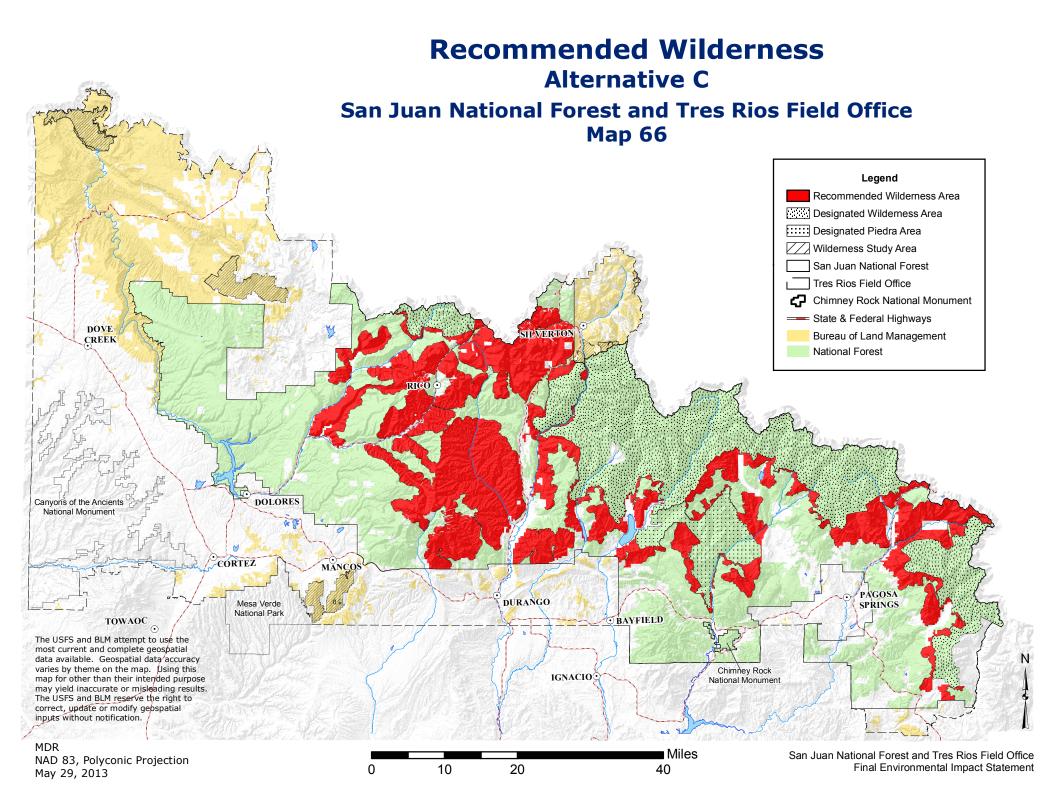


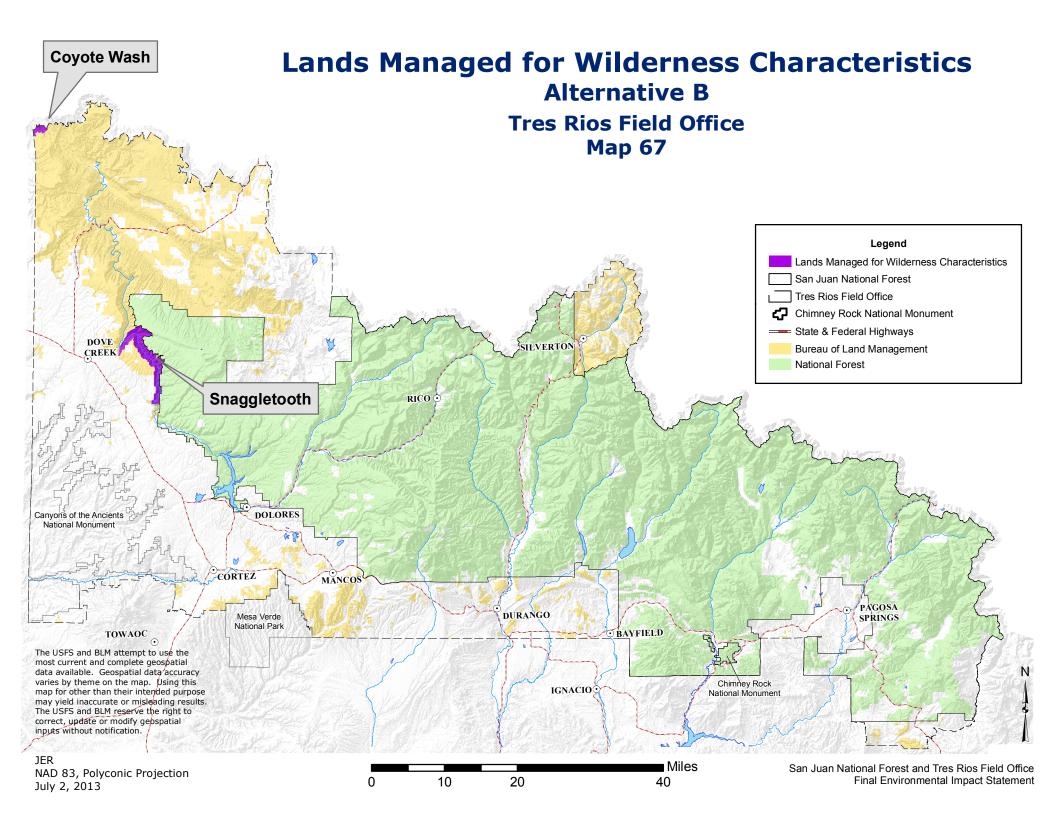
**Solid Leasable Minerals** San Juan National Forest and Tres Rios Field Office **Map 62** Legend Potash Prospecting Permit Application DOE Uranium Lease Tract Withdrawal Coal Lease Cases No Potential For Coal Low Potential For Coal Medium Potential For Coal High Potential For Coal No Potential For Sodium Potential For Sodium Only Potential For Sodium and Potassium San Juan National Forest Tres Rios Field Office DOVE CREEK SILVERTON Chimney Rock National Monument State & Federal Highways Bureau of Land Management RICO O National Forest National Monument PAGOSA SPRINGS DURANGO Mesa Verde National Park • BAYFIELD TOWAOC The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this Chimney Rock IGNACIO map for other than their intended purpose National Monument may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification. ■ Miles San Juan National Forest and Tres Rios Field Office NAD 83, Polyconic Projection 20 Final Environmental Impact Statement 10 40 June 11, 2013

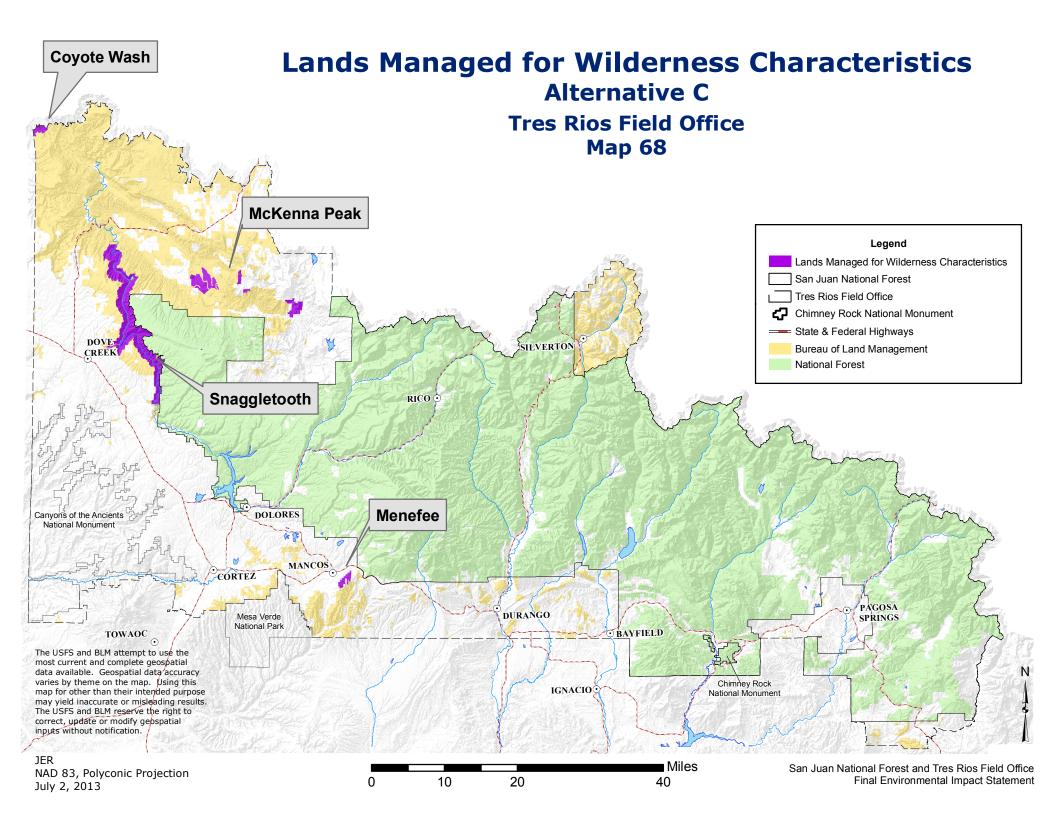


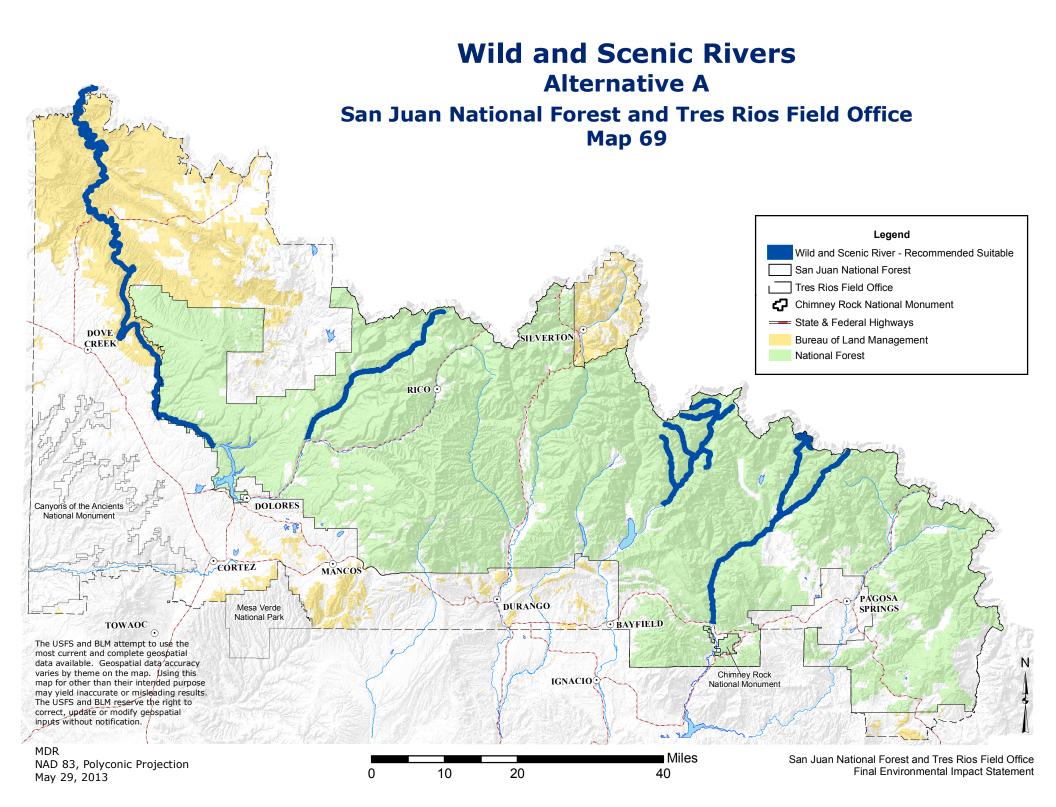


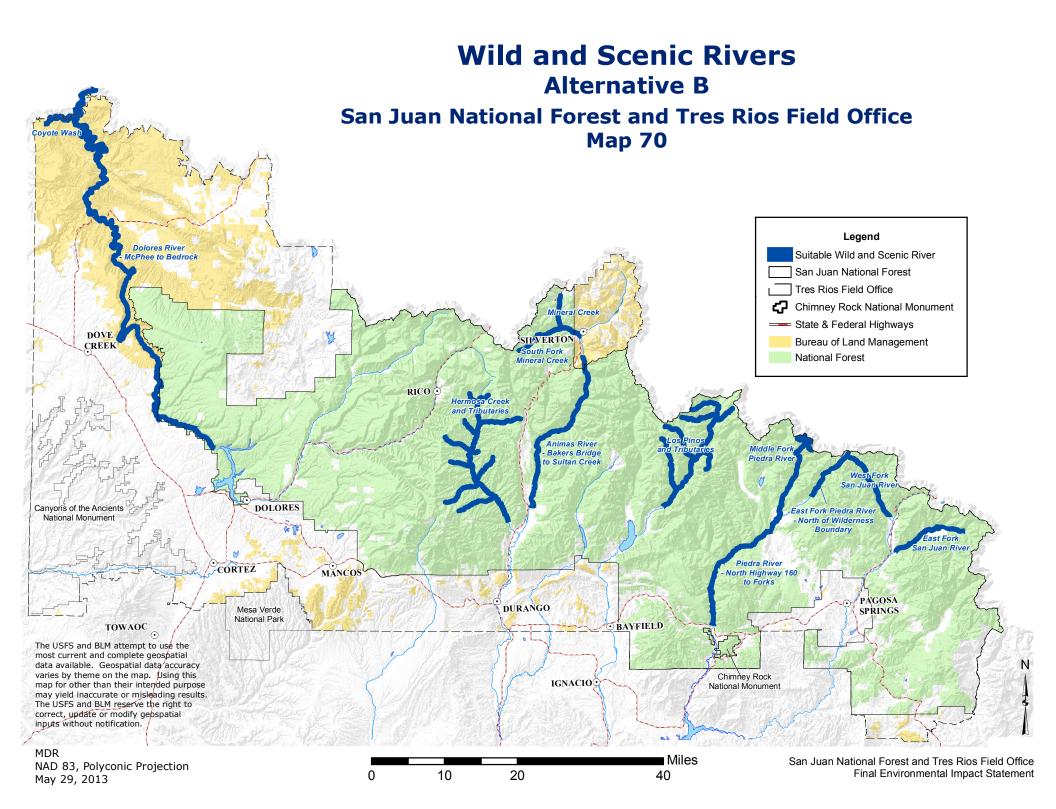


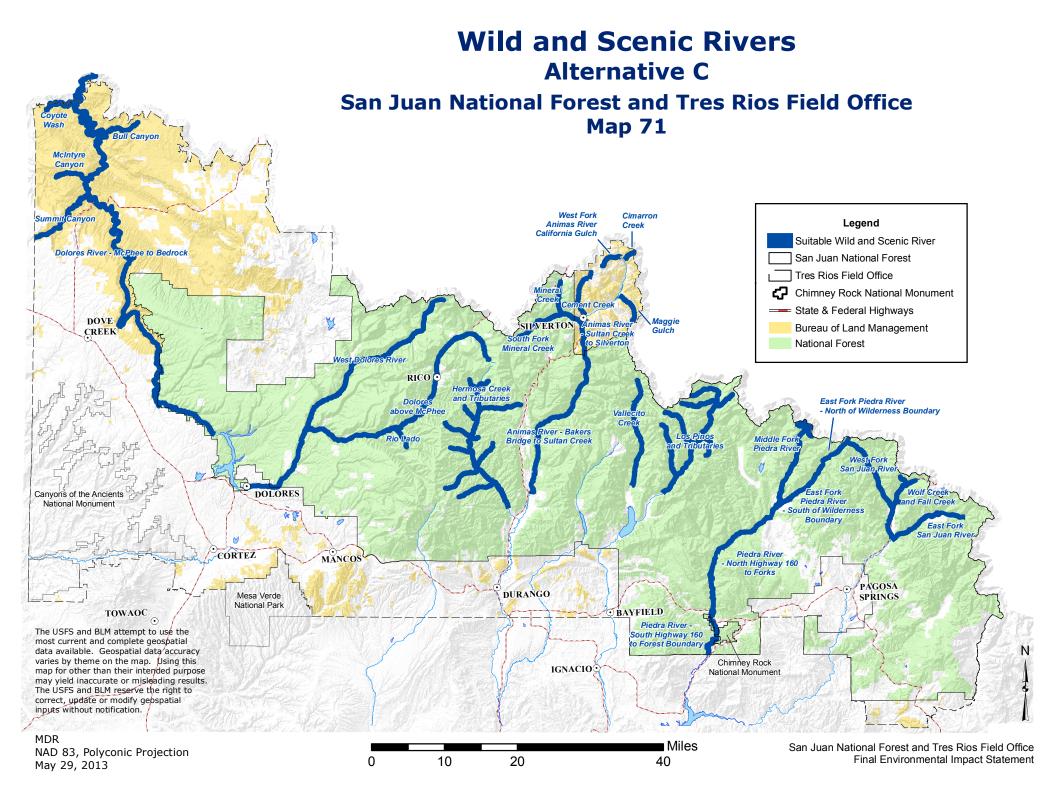


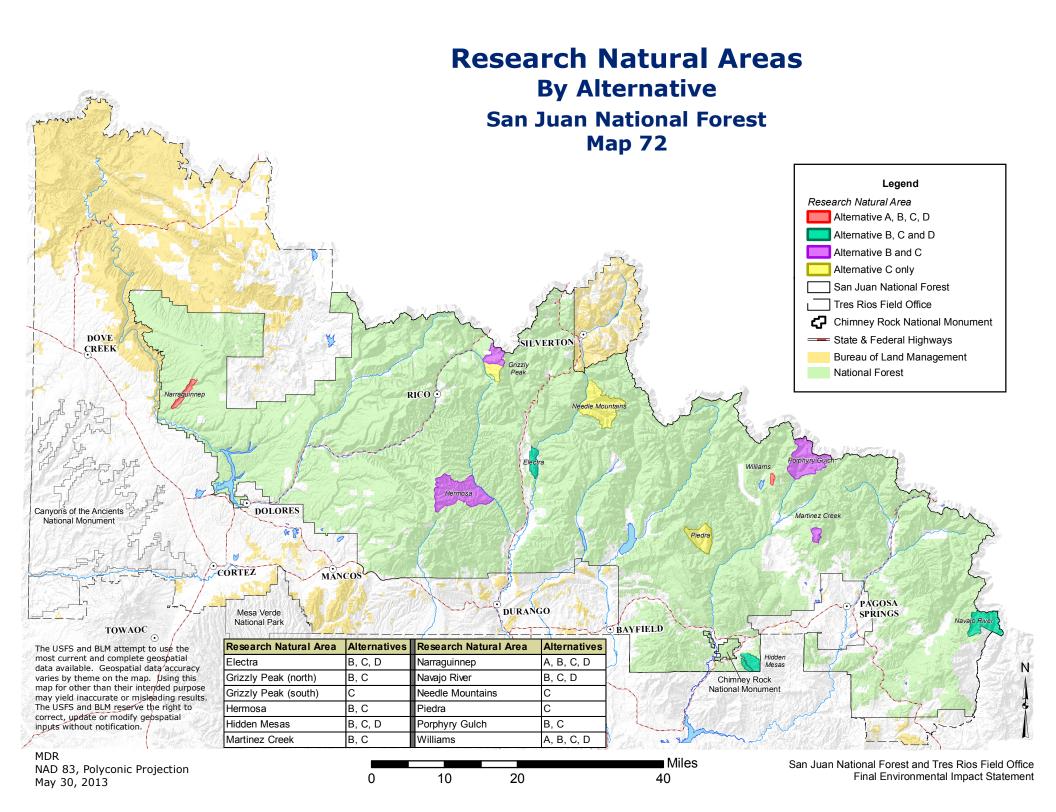




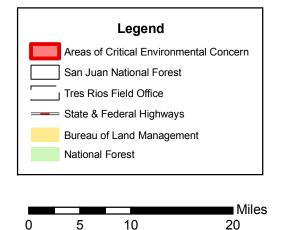






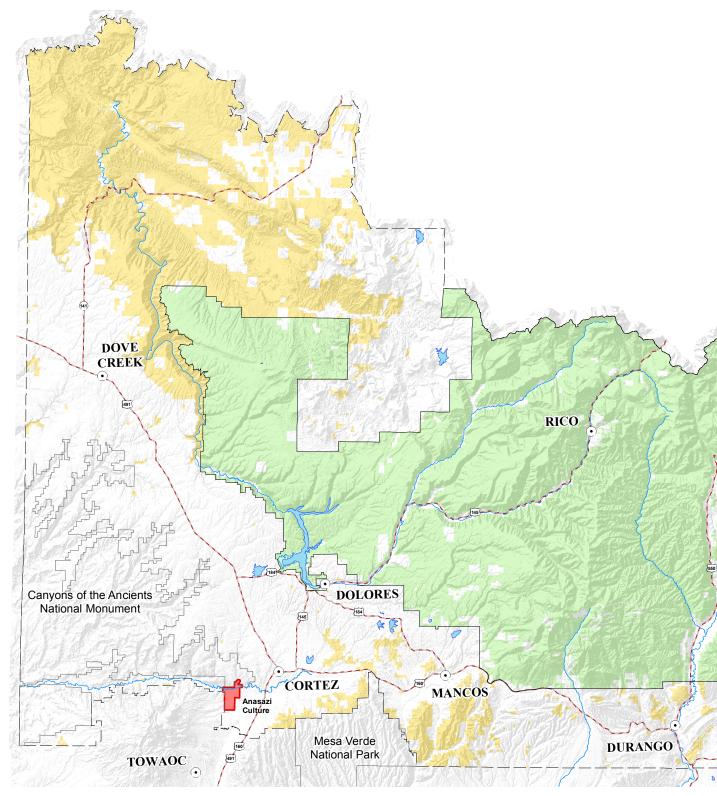


# Areas of Critical Environmental Concern Alternative A Tres Rios Field Office Map 73

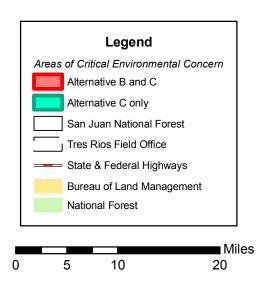


The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

MDR NAD 83, Polyconic Projection May 29, 2013

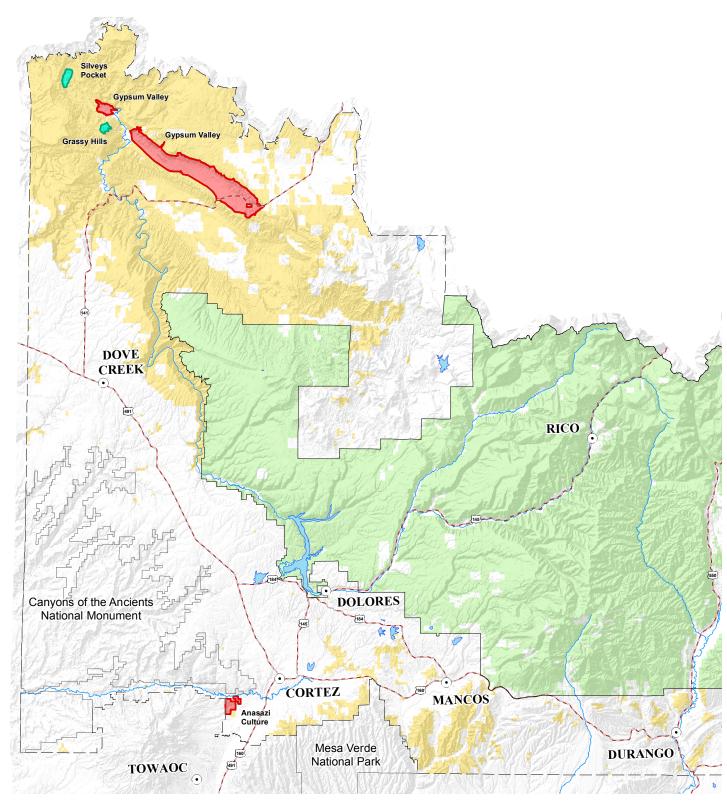


# Areas of Critical Environmental Concern Alternatives B and C Tres Rios Field Office Map 74



The USFS and BLM attempt to use the most current and complete geospatial data available. Geospatial data accuracy varies by theme on the map. Using this map for other than their intended purpose may yield inaccurate or misleading results. The USFS and BLM reserve the right to correct, update or modify geospatial inputs without notification.

MDR NAD 83, Polyconic Projection May 29, 2013



### **Appendix W**

## **Analysis of Plans and Land Use Policies of Adjacent Governments and Tribes**

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Final San Juan National Forest and Proposed Tres Rios Field Office Land and Resource Management Plan

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#### **CHAPTER 1. INTRODUCTION**

The Forest Service 1982 Planning Regulations require a review of planning and land use policies of other agencies, governments, and tribes to compare the goals and objectives of their plans and policies with the direction in the revised Land and Resource Management Plan (LRMP) (36 Code of Federal Regulations [CFR] 219.7(c)). Bureau of Land Management Planning Regulations also require that the proposed plan be as consistent as possible with plans, policies, or programs of other agencies, tribes, and local governments (43 CFR 1610.3-1(d)). Comprehensive plans, subarea plans, land use codes, and other applicable planning and land use policies were obtained for relevant counties, municipalities, and tribes with jurisdiction within or adjacent to the San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO). Each plan or code was reviewed for policies relevant to public land management, natural resource management, and intergovernmental coordination.

All plans and policies were retrieved electronically. For this review, it was assumed that the plans available on each local government's official website were the most up-to-date versions (as of July 2013). If plans could not be located electronically, inquiry was made to the respective entity to retrieve the relevant document. The scope of review was limited to comprehensive plans, subarea plans, and land use codes because it was assumed that these documents fully represented the planning and land use policies for local governments. Assuming that based on location, some subarea plans would not be relevant to the LRMP, subarea plans were only reviewed if the subarea included public lands or discussed public land management.

A brief summary and analysis of each plan is presented below, which includes a consideration of the plans' objectives and an assessment of the plans' interrelated impacts. If any conflicts were identified between the LRMP and the county, municipal, or tribal plan or policy, a consideration of alternatives for their resolution is discussed.

#### **CHAPTER 2. COUNTIES**

#### 2.1 Archuleta County

#### Archuleta County Community Plan: 2001

The major focus of the Archuleta County Community Plan is growth management and the community's interest in preserving open space. Archuleta County's rapid growth is also discussed in the LRMP, as well as the pressure existing on transportation systems in the county due to that growth (see LRMP Section 3.4).

Wildlife corridor and habitat protection is supported by Archuleta County and the LRMP (2.3.66, LRMP). Archuleta County's plan establishes a Critical Wildlife Overlay District (with the habitat areas identified by Colorado Parks and Wildlife [CPW]) that designates additional site development standards in critical wildlife habitat areas in order to avoid or minimize disruption of wildlife habitat.

Protected open spaces are valued highly by Archuleta County. Preservation of agricultural viability in the county is important, as well as preserving the county's heritage.

The county has policies that support land trades of unusable agricultural land for adjacent public lands that could be utilized agriculturally with the Bureau of Land Management (BLM) and U.S. Forest Service (USFS). The LRMP also supports acquiring or disposing of land for certain purposes.

No policies in the Archuleta County Community Plan appear to be in conflict with the LRMP.

## Archuleta County Regional Parks, Recreation, Open Space, and Trails Master Plan: 2007

This plan's recommendations focus on private land. It is valuable to note, however, the importance of trail connectivity between residential areas that abut National Forest System (NFS) land. Two trail recommendations, the Pagosa Springs Regional Loop and the Piedra Road Corridor, involve connections to NFS land. The LRMP does not provide trail-specific recommendations or plans, though Section 2.13 "Access and Travel Management" sets forth desired conditions and objectives to guide future travel management planning decisions that are site-specific. No policies in this plan appear to conflict with the LRMP.

#### Archuleta County Community Development Action Plan: 2012

Projects described in the Archuleta County Community Development Action Plan are consistent with the LRMP. Specific road decisions are not included in the LRMP, but the Archuleta County Community Development Action Plan involves more site- and road-specific objectives.

Archuleta County's desired conditions are very similar to the LRMP's objectives for Chimney Rock National Monument (see LRMP Section 3.17)

Archuleta County and LRMP policies related to ponderosa pine and pinyon-juniper forest sustainability are also compatible. The LRMP specifically states:

- 3.4.1 Management activities maintain or enhance the ecological sustainability and integrity of the area. The demands of residents and users are balanced with the protection of watersheds, wildlife habitat, vegetation, soil productivity, and undisturbed natural areas.
- 2.2.7 Old growth ponderosa pine, old growth pinyon-juniper and old growth warm-dry mixed conifer forests are more abundant, occupy more acreage, and are well distributed on SJNF and TRFO lands.
- **2.10.1** Terrestrial ecosystems have age- or size-class diversity and compositional diversity that make them resistant to insect and disease outbreaks.

- **2.10.3** Epidemic outbreaks are rare after management actions have been completed.
- **2.10.6** Within the next 10 years, reduce the risk of mortality due to bark beetles by increasing the mature-open development stage of ponderosa pine forests by 20,000 to 40,000 acres by using timber harvest and prescribed fire in the mature-closed development stage of ponderosa pine forests on SJNF lands.
- 2.2.52 Within 15 years, increase the percent of ponderosa pine forests in the young development stage from 0% to 3% on SJNF and TRFO lands by using mechanical treatments (e.g., timber harvest) or fire (prescribed or natural ignitions).

#### Other Plans and Policies

The Archuleta County Land Use Regulations were reviewed but no specific policies related to NFS or public land management issues were found. The Archuleta County Town-to-Lakes Trail Master Plan (2011) was also reviewed, but because this plan is focused on a small area in Pagosa Springs, it did not have policies relevant to public land management.

#### 2.2 Conejos County

Because no TRFO land and only a very small portion of the SJNF (approximately 6,000 acres or less than 1% of total county land) extends into Conejos County, it was not reviewed as part of this analysis.

#### 2.3 Dolores County

#### **Dolores County Master Plan: 1996**

This plan states that low-density development and rural lifestyle are highly valued and that the county does not want tourism or outdoor recreation to overwhelm the county's character. Agriculture is extremely important and the importance of protection of their water sources, particularly the Dolores Project, is referenced multiple times.

Dolores County wishes to preserve the following uses on public lands: timber, grazing, minerals and energy development, and recreational, cultural, and visual resources. Active participation in federal land management and decision-making processes is also mentioned as important to the county. Maintaining access to public lands for fishing and hunting, wildlife habitat, and scenic characteristics is very important to Dolores County.

The LRMP's desired conditions for the Dolores County geographic area appear to be consistent with the policies in the Dolores County Master Plan. These desired conditions involve working lands, scenic vistas, Dolores River system health (see 3.2.2 below), protection of cultural and historic resources, shared and access for motorized and mechanical recreation opportunity, as well as foot and horseback opportunities. No policies appear to be inconsistent with the LRMP.

3.2.2 The Dolores River system remains a primary water source in order to meet domestic and agricultural needs while, at the same time, contributing a wide array of recreational, ecological, and aesthetic services. Collaborative efforts support watershed health, instream water quality, scenic assets, healthy native and sport fish populations, rafting and flat water boating opportunities, and flow and spill management below McPhee Dam in support of ecological, recreational, reservoir management, and water rights imperatives.

#### **Dolores County Community Development Action Plan: 2012**

Dolores County has many community development objectives. Relevant policies include promoting tourism and trail systems, and maintaining ongoing relationships with public lands offices. This action plan is more of an economic development strategy and has less direct relevance to the LRMP as a county planning document. No projects, outcomes, or expected actions appear to conflict with the LRMP.

#### Dolores County Development and Land Use Regulations: 2012

Dolores County has incorporated public lands policy into its Development and Land Use Regulations. The policy stated in these regulations attempts to retain all historic uses on public land, as well as all historic motorized and non-motorized recreational use travel routes. Particular emphasis is placed on maintaining hunting use and other historic recreational uses. Policy in the regulations also states that all historic trails, paths, or roads must remain open.

Additionally, Dolores County has set up a process in its Development and Land Use Regulations for when a federal or state action is determined to significantly impact use or access on public lands. The intent of this section is to allow for as much participation as possible in those actions and involves impact determinations, research, coordination meetings, and a public hearing.

The Public Lands Policy and Plan section of the Dolores County Development and Land Use Regulations may be in conflict with the LRMP. The USFS and BLM engage in active management, meaning that changes in management of public lands, including those in Dolores County, would occur when and where deemed necessary for the health of the land, to manage conflicting uses, or for a variety of other reasons that further the mission of the USFS or BLM. While the LRMP provides strategic guidance for public land management and does not determine site-specific, route-by-route determinations, historic uses and routes are not assured in perpetuity.

LRMP policies relating to future travel management planning are most relevant to this issue and do provide an alternative for the resolution of this policy conflict through Alternative A, which continues current management. However, travel management planning and other project-level actions would likely alter access and uses from what was allowed historically regardless of the alternative selected. This has already occurred with the approval of the Boggy Glade Travel Management Plan in 2012. LRMP components and direction with a direct bearing on this issue are provided below.

"Access and opportunity to experience areas through both motorized and non-motorized travel is a key component of recreation, as well as a primary management emphasis for the SJNF and TRFO. Efforts would focus on the designation of effective motorized and non-motorized travel routes over the long-term, consistent with desired conditions" (LRMP Section 2.13).

- **2.13.10** Travel management plans are complete for all SJNF and TRFO lands within 5 years of adopting this LRMP. Travel management planning remains a continuous process designed to improve the transportation system on SJNF and TRFO lands.
- 2.13.11 Motorized and non-motorized users, as well as local, state, tribal, and other federal agencies, are actively engaged in travel management planning, route designation and implementation, and route monitoring on SJNF and TRFO lands.
- 2.13.19 Develop travel management plans in accordance with the designation criteria in 36 CFR 212, Subpart B, for NFS lands and 43 CFR 8342.1 for BLM lands. Routes that are not included in the designated motorized transportation system will be evaluated for their resource impact potential. Those with high potential for resource impacts will be prioritized for decommissioning as part of the implementation plan for each individual travel management plan decision. Each implementation plan will identify those routes prioritized for decommissioning, the method(s) that may be used, and a schedule for completion.

#### 2.4 Hinsdale County

#### Lake City and Hinsdale County Community Plan: 2006

The Lake City and Hinsdale County Community Plan has many policies relevant to public land management. All of the policies appear to be consistent with the LRMP. The plan advocates for Lake City's and Hinsdale County's participation in decisions regarding the public lands. The county and town

are well informed regarding cooperation with public land management and emphasize their desire to participate in decision-making to support their community interests.

The management of public lands for multiple use is highlighted as very important to the town and county's economic vitality, so they strongly support multiple use management. The separation of motorized and non-motorized uses, while still allowing for both types, is important to the county and town. Finally, Hinsdale County supports public land exchanges under similar circumstances as what is supported by the LRMP.

#### Other Plans and Policies

The Hinsdale County Community Wildfire Protection Plan (2010) was also reviewed; the USFS participated in creation of this plan. There are not many specific policies, but general direction in the plan does not conflict with the LRMP. Hinsdale County Zoning and Development Regulations (2011) were also reviewed; there were no specific policies related to public land management.

#### 2.5 La Plata County

#### La Plata County Comprehensive Plan: 2001

Only a few policies in the La Plata County Comprehensive Plan are applicable to public land management. The relevant policies appear to be consistent with the LRMP. La Plata County recognizes the importance of multiple use recreational opportunities on public lands and has also developed district land use plans to aid federal land management agencies in understanding what their preferred land uses are near public lands.

#### La Plata County Trails Plan: 2000

The La Plata County Trails Plan places exceptional emphasis on public land access. The USFS and BLM are listed as likely partners on many of the nearly 100 trail need and opportunities identified in the plan. Multiple use access (hunting, fishing, recreation, equestrian, motorized travel) is highlighted. USFS and BLM representatives were actively involved in the preparation of the La Plata County Trails Plan, which is intended to complement the land management plans of the agencies. No policies appear inconsistent with the LRMP. More detailed analysis and comparison of trail development would occur in a travel management plan setting.

#### La Plata County Land Use Code

The La Plata County Land Use Code includes some policies related to public lands, and all the relevant policies appear consistent with the LRMP. The code recognizes the importance of maintaining access to public lands and encourages the completion of needs analyses for potential public access. Preservation of visual resources is also mentioned as important. The county welcomes the opportunity to comment on development taking place on federal lands.

#### Other Plans and Policies

The North County District Land Use Plan (2004) has policy goals common to those of the LRMP. Scenic integrity of the area is very important. No policies appear to be in conflict with the LRMP. For the Junction Creek District Land Use Plan (1997), the protection of natural environment and wildlife corridors is a common policy, as well as scenic view retention, adequate parking, public land access, and managing uses sensitive to natural environment. None of these policies appear to conflict with the LRMP.

Access to public lands is an important issue in the Vallecito District Land Use Plan (2005), as well as retaining multiple uses on public lands. Maintenance of natural environmental qualities is also important. Converting public lands to private ownership is discouraged. No policies conflict directly with the LRMP other than discouraging public land conversion, which is supported in the LRMP if done for the purpose of consolidating land ownership (see LRMP Section 2.18)

The West Durango District Land Use Plan (1997) was reviewed; no specific policies are related to public land management. The La Plata County Regional Transit and Future Land Use Plan (2009) was also reviewed; no specific policies are related to public land management, and no policies reviewed were inconsistent with the LRMP.

#### 2.6 Mineral County

#### Mineral County Comprehensive Plan

The BLM and USFS were unable to locate the Mineral County Comprehensive Plan. An inquiry was made with Mineral County, who confirmed the existence of a county comprehensive plan completed in the 1970's, but the county was also unable to locate or produce it (Cahill 2013).

The principal issue that intersects between the SJNF and Mineral County is the proposed expansion of Wolf Creek ski area, which is strongly supported by the Mineral County Board of County Commissioners. This was the primary topic of discussion when SJNF officials met with the Mineral County Board of County Commissioners on June 3, 2012, to update the Commissioners on the status of the LRMP and Final Environmental Impact Statement (FEIS). As discussed during this meeting, the LRMP makes no decision with regard to the Wolf Creek ski area proposed expansion, but does include management direction that could accommodate a potential expansion were it to be approved under a separate analysis.

#### Other Plans and Policies

The Mineral County Zoning Regulations were reviewed; there were no references to public land management policies.

#### 2.7 Montezuma County

#### Montezuma County Comprehensive Land Use Plan: 1997

The Montezuma County Comprehensive Land Use Plan recognizes the importance of federal lands to the economy, tradition, and future of the county.

Maintaining agricultural viability is of critical importance to the county and the role of continued grazing on federal land is an integral component of maintaining agricultural viability. Also, if open space and grazing are still economically viable, the future subdivision of agricultural lands may be avoided.

The comprehensive plan includes a policy that supports the continuation and coexistence of multiple uses on federal lands. Another policy is to keep all the industries related to the multiple use of federal lands viable and seek compatibility between them. The highest priority is placed on the continued use of historic uses of federal land, as natural resource economies are vital to the preservation of Montezuma County. The historical and traditional uses of federal lands that Montezuma County depends on are livestock grazing, timber harvesting, mining, energy development, water resource development, recreation, hunting, and the preservation of scenic, historic, and biological resources. Other policies call for the strengthening of linkages between healthy landscapes and natural resource industries.

Montezuma County also recognizes the contribution of wildlife and open space to the local economy as an attraction for visitors and hunters.

Joint planning and intergovernmental relationships are also of great importance to Montezuma County. The county advocates facilitating meaningful community-based involvement in federal land policy, planning, and decision making. Policies in its comprehensive plan state that the county should strengthen meaningful relationships between land managers and land users, and seek active community participation in the management of federal lands. The plan states that the county has an obligation to coordinate with other local governments and advocate for local interest at higher levels of government,

seeking active participation in local, state, and federal government relationships. Further, the county wishes to support efforts that minimize resources tied up in non-productive conflict and utilize all resources in collaborative efforts that support the plan's policies.

Another policy in the Montezuma County Comprehensive Land Use Plan states that the county should monitor, comment upon, and where appropriate seek administrative and regulatory relief if regulations negatively impact economic viability of the community and the goals of the plan. The plan mentions that the main issues related to this are those which may restrict private property use are the Endangered Species Act, predator control and reintroduction, and wetlands protection.

The initiation of the LRMP revision process is mentioned in the comprehensive plan, which states that the revision would support the county's policies if it provides for balanced ecological and community health and productivity. There is a concern and atmosphere of uncertainty discussed about current and future prospects for federal land uses in Montezuma County and the subsequent impact on the local economy.

Finally, a 2004 amendment to the plan is included, which emphasizes the importance of the water quality of the Dolores River.

The LRMP does not appear to conflict with the policies of the Montezuma County Comprehensive Land Use Plan. Continued use of federal land for grazing is supported in the LRMP. Desired conditions for livestock and rangeland management include:

- **2.7.1** Rangeland provides forage for qualified local livestock operations and helps ranches remain sustainable and intact.
- **2.7.2** Rangelands and permitted livestock grazing use contribute to the maintenance of large open spaces on private lands.
- **2.7.3** Permitted livestock grazing fee collections contribute to the local county fund base for roads, schools, and range improvements.
- 2.7.4 Rangelands provide healthy and sustainable habitat for wildlife populations that, in turn, support recreational hunting, fishing, and/or viewing (thereby contributing to the local and regional economy).
- 2.7.5 Rangelands provide diverse, healthy, and sustainable plant communities and conserve soil quality.

Objectives for livestock and rangeland management also support cooperation:

- 2.7.9 Annually administer at least 25% of active grazing allotments to standard on a priority basis ensuring that all active grazing allotments during the life of the LRMP receive appropriate administration. Work with grazing permittees and peers to resolve livestock grazing management issues. Take appropriate administrative action as needed to improve livestock grazing management.
- **2.7.10** Within 15 years, working with partners and cooperators, reconstruct 25% of priority structural range improvements in order to maintain infrastructure integrity.

LRMP area direction for the TRFO also has similar policies to those espoused in the Montezuma County Comprehensive Land Use Plan related to intergovernmental cooperation, the effect of Endangered Species Act protection, and the recognition of sustaining local economies through natural resource industries.

3.1.6 Abundance and viability of Gunnison sage-grouse, and its habitat, are achieved through a range-wide perspective on species management that provides a healthy sagebrush steppe ecosystem so that the sage-grouse, and other sagebrush obligate species in the system, benefit. An atmosphere exists of cooperation, participation, and commitment among wildlife managers, landowners, private and public land managers, other stakeholders, and the interested public in the development and implementation of conservation actions that recognize the importance of

sustainable local economies as being essential to successful conservation. Gunnison sagegrouse protection and restoration is enhanced through these cooperative efforts while, at the same time, oil and gas development, mining, recreation, and grazing continue.

LRMP area direction for the Dolores Ranger District area, specifically the desired conditions, appears consistent with the Montezuma County Comprehensive Land Use Plan policies:

- 3.2.1 Public lands continue to function as "working lands." Collaborative forest health and rangeland management practices reduce wildfire hazards, contribute to the viability of private ranch lands, and sustain ecosystem services (including watershed health and wildlife habitat). The local economy benefits from, and contributes to, sustainable resource management, as well as the preservation of open space.
- 3.2.2 The Dolores River system remains a primary water source in order to meet domestic and agricultural needs while, at the same time, contributing a wide array of recreational, ecological, and aesthetic services. Collaborative efforts support watershed health, instream water quality, scenic assets, healthy native and sport fish populations, rafting and flat water boating opportunities, and flow and spill management below McPhee Dam in support of ecological, recreational, reservoir management, and water rights imperatives.

Because of the comprehensive plan's strong emphasis on unencumbered and continued grazing, one area of potential conflict with the comprehensive plan is provisions in the LRMP that discuss canceling grazing privileges and placing certain limitations on grazing:

- 2.7.15 Land managers should phase out grazing systems that allow for livestock use in an individual unit during the entire vegetative growth period (season-long), except where such management has been determined to be able to achieve or maintain desired conditions.
- 2.7.16 If grazing privileges are relinquished or cancelled on SJNF or TRFO lands where fragile soils, low forage production, low livestock water availability, and/or conflicts with other resources make livestock grazing undesirable, the privileges should not be re-allocated.
- 2.7.17 Prior to allocating grazing privileges for a new grazing permittee on unallocated grazing allotments, the needs of existing rangeland management, as well as ecological diversity and species viability, should be considered.
- **2.7.18** Grazing systems should be designed in a manner to provide periodic rest to forage species during the critical growing season in order to promote species diversity, reproduction, and productivity.
- 2.7.22 Grazing management activities should be modified in, or livestock excluded from, riparian areas that are "nonfunctional" or "functional-at risk" with a downward trend (as rated by the Proper Functioning Condition protocol), where livestock have been determined to be a key causative agent.
- 2.7.25 The BLM should consider closing custodial allotments when term grazing permits expire where public lands cannot be properly managed due to the subdividing of surrounding base property, or due to insufficient or livestock water availability, access, management flexibility, and/or lack of capable rangeland.

Canceling grazing privileges and modifying livestock grazing practices as allowed through allotment management plans is authorized through agency regulation and can occur regardless of the provisions proposed in this LRMP. Thus, these guidelines do not directly conflict with the Montezuma County Comprehensive Land Use Plan. However, in recognition of the importance of this issue for the county, the SJNF and TRFO would coordinate closely with Montezuma County when these guidelines are being considered for implementation on any allotment within the county.

Montezuma County also emphasizes the importance of intergovernmental relations, and the comprehensive plan states that the county has an obligation to advocate for local interests at higher levels of government. Various activities such as cooperator agreements, regular briefings, Resource Advisory Councils, and ongoing engagement between BLM and USFS offices and their respective counties allow public lands and their local communities to be better served by the involvement of local government in BLM and USFS decision-making.

In creating the LRMP, a major effort was undertaken to gather and use public knowledge regarding values, knowledge, and uses of SJNF and TRFO lands. Initial public participation focused on visioning and identifying management challenges. Additional information was gathered during the comment periods for the Draft Environmental Impact Statement (EIS) in 2007 and Supplement to the EIS in 2011. A summary of public participation activities is provided in Volume 1, Chapter 4.

#### Montezuma County Resolution 08-2010

A resolution is a general statement of policy or position of a city or county, whereas an ordinance is a local law. This resolution is a general statement of Montezuma County's position and thus is important to include in the adjacency analysis. The resolution calls for coordination between federal and state agencies with the Montezuma County Board of Commissioners, following all applicable laws, and that private property and the economic stability of the county be addressed and provided for in plans, policies, and actions. In the past, the SJNF and TRFO have had discussions and exchanged written communication with Montezuma County regarding coordination that revealed some differences between the county and agencies in what is expected or required through "coordination." Because of these different expectations, this presents an area of potential conflict. However, Resolution 08-2010 refers to coordination as required and mandated by federal law. The requirements of the USFS and BLM that could be interpreted as "coordination" requirements are discussed below.

Based on applicable laws and regulations, the USFS and BLM are required to seek comment from state or local agencies on a Draft EIS when the agencies are authorized to develop and enforce environmental standards (40 CFR 1503.1(a)(2)(i)). The USFS and BLM must cooperate with state and local agencies to the fullest extent possible to reduce duplication between National Environmental Policy Act (NEPA) and state and local requirements (40 CFR 1506.2). When the USFS or BLM and the state or county each is preparing an EIS, the USFS or BLM may designate the state or county as a joint lead agency (40 CFR 1501.5(b) and 1508.5). The USFS or BLM also may give cooperating agency status to a state or local agency, whose role would be to assist the USFS or BLM in preparing an EIS (40 CFR 1501.6 and 1508.5). In addition, the Federal Land Policy and Management Act (FLPMA) contains a provision (43 U.S.C. 1712(c)(9)) that applies to the BLM in its development and revision of land use plans that requires that the BLM coordinate land use inventory, planning, and management activities for the public lands with the planning and management programs of state and local governments where those lands are located and make their land management plans consistent with state and local plans to the extent consistent with federal law and the purposes of FLPMA.

The SJNF and TRFO have and would continue to coordinate, per the laws and regulations cited above, with Montezuma County through the development and implementation of the LRMP. The requirement for coordination and the other topics addressed in Resolution 08-2010 are consistent with the LRMP.

#### Other Plans and Policies

The Montezuma County Land Use Code (2010) was also reviewed; it includes no specific regulations related to public land management.

#### 2.8 Montrose County

#### Montrose County Master Plan: 2010

Since only a small portion of the TRFO extends into the western portion of Montrose County, focus for this analysis was primarily placed on the West End Planning Area policies of the Montrose County Master Plan. Montrose County discussed the importance of balancing natural resource utilization and conservation. Mitigating the impacts of oil, gas, and other mining development is important to the county, as well as preserving water quality and wildlife corridors. Agricultural land preservation is also of value. Tourism is a major economic driver in Montrose County and recreational opportunities are very important. Maintaining access to public lands is also vital and the plan calls for collaboration and participation with land management agencies.

Water quality, particularly salinity, is also discussed. Salinity is also addressed in the LRMP:

- 2.13.28 Road Density Guideline for Water Quality and Watershed Health on TRFO Lands: In order to protect water quality, watershed function, major surface source water protection areas for municipalities, and to ensure compliance with the Colorado River Basin Salinity Control Act, use the best available information for determining the appropriate level of road density when analyzing and approving management actions that affect motorized routes.
- 3.1.7 Salinity and sediment contributions of the Dolores River tributaries (including Disappointment, Big Gypsum, Little Gypsum, and Dry Creeks) are reduced through an integrated activity approach that achieves reduced erosion and improves land health.

In sum, all relevant policies in the West End Planning Area focus of the Montrose County Master Plan appear to be consistent with those stated in the LRMP.

#### Other plans and policies

The Montrose County Zoning Regulations were also reviewed; they include no relevant public land management regulations.

#### 2.9 Rio Grande County

#### Rio Grande County Joint Master Plan: 2004

Because only a small portion of the SJNF exists within Rio Grande County, not many of the policies were relevant to the LRMP. The Rio Grande National Forest accounts for nearly half of the county's land, and the Continental Divide separates the Rio Grande National Forest and SJNF. Land management policies in this plan generally regarded the Rio Grande National Forest. However, general policies of natural resource conservation and policies supporting tourism and outdoor recreation are applicable and consistent with the LRMP.

#### Rio Grande Land Development Code: 2011

This code contains scarce policy related to public land management. The Agricultural Forestry Zoning District aims to conserve forest resources, protect the natural environment, and preserve uninhabited areas. Only a small portion of the SJNF extends into Rio Grande County, the majority of which is within a designated wilderness area. The policies appear in line with the LRMP.

#### 2.10 San Juan County

#### Town of Silverton and San Juan County Master Plan: 2010

Tourism is very important to Silverton and San Juan County. Tourism markets are envisioned to be continually expanded, with emphasis on year-round attractions. The town and county want a variety of recreation options to be enhanced and expanded with balanced motorized and non-motorized opportunities available.

The importance of backcountry road access is emphasized. All-terrain vehicle transportation directly into town is supported. San Juan County and Silverton discourage new development to take away existing public access across private property. Access to mining claims is also mentioned, and travel to those claims over BLM or NFS land is encouraged. Mineral development is still available on mining claims.

Water quality protection is also very important to San Juan County and Silverton.

Backcountry county land is envisioned by Silverton and San Juan County to be primarily natural with small pockets of recreation and evidence of mining history. The BLM works with the town and county to implement recreation vision and goals in the plan. Heritage tourism is supported and promoted.

The LRMP has consistent policies stated in its direction for the Silverton area (Section 3.24):

"As the result of the configuration of mineral patents and private lands, San Juan County has a fragmented land ownership pattern of public lands isolated by private lands sometimes called 'splinters' or 'slivers.' These splinters or slivers can range in size from less than an acre up to 40 acres and oftentimes make accessibility to public lands difficult."

- 3.24.1 Interpretation of the historic landscapes and features of the Silverton [Special Recreation Management Area] is made available through a range of effective and appropriate venues. Information is designed to enhance the touring experience and encourage the greatest extent of appreciation and protection of these precious assets.
- **3.24.11** Although private land access is provided, as required, opportunities for protection of key resources are sought through the county development process, easement options, and acquisition.
- 3.24.17 Lands would remain open to mineral entry except where limited and specific needs for withdrawal or segregation. When possible, new mining projects would consider reclamation and remediation of historic mining operations to the extent economically, technologically, and legally possible.

The LRMP has no specific reference to the Kendall Mountain Recreation Area, mentioned in the Town of Silverton and San Juan County Master Plan as a potential site for transfer of ownership, but does state:

"In keeping with the BLM mission of "serving communities," lands in San Juan County near Silverton may be made available for recreation and public purposes or sold either competitively or directly for expansion of residential, commercial, recreation, or infrastructure uses."

3.24.13 Where public lands 1) are isolated by surrounding private parcels with limited or no public access, 2) have minimal cultural/natural resource or recreation values to protect, and 3) are not needed for any federal project or resource management activity, the BLM may consider exchanges, sales or other disposal in order to improve the overall management of the public lands. Each proposal will be evaluated on a case-by-case basis, including environmental analysis under NEPA.

#### San Juan County Zoning and Land Use Regulations: 2012

These overlay districts appear to be consistent and supportive of LRMP policies for the area.

#### 2.11 San Miguel County

#### San Miguel County Comprehensive Development Plan: 2008

The San Miguel County Comprehensive Development Plan, divided into planning areas, has only certain applicable portions to consider related to the LRMP. Only the TRFO is located within San Miguel County; the SJNF does not extend into the county. This BLM land is expansive but is only located in the western half of San Miguel County. For this reason, only policies relevant to the "West End," the entire county, and the "Remainder of County" were analyzed.

The San Miguel plan includes policies supporting multiple use of the public lands. Policies are also included to promote recreation and preserve resources while ensuring access. Mining on federal lands is supported with county cooperation and assurance of adequate housing for mining employees. A sustainable logging industry is encouraged throughout the county while protecting environmentally sensitive areas and ecosystems. Expansion of outdoor recreation facilities such as picnic and camping areas is supported in the remainder of the county.

No policies in the San Miguel County Comprehensive Development Plan appear to conflict with the LRMP.

#### San Miguel County Land Use Code: 2010

The San Miguel County Land Use Code goes into significant detail regarding public land policies. The county has specific policies for property adjacent to public land that do not appear to conflict with the LRMP. Access to public lands is a primary focus as the county seeks to preserve access and identify additional access points to secure. Non-motorized, low-impact use of public land is favored in San Miguel County. Policies in the land use code also seek to protect wildlife habitat, water resources, and wetlands in a manner consistent with LRMP policies. No policies conflict with the LRMP.

#### Other Plans and Policies

The San Miguel County Open Lands Plan mostly establishes the mission of the San Miguel County Open Space Commission and sets up a strategic framework for open space acquisition. It does not set up particular policies related to public land management. The Wright's Mesa Master Plan (2008) was reviewed, but this subarea is located east of BLM land in San Miguel County; public land access was mentioned but is relevant to the Uncompangre National Forest, not the land managed by the LRMP. The Telluride Regional Area Master Plan (2006) was reviewed, but this subarea is located significantly east of BLM land in San Miguel County; the area is much more relevant to Uncompangre National Forest planning than the LRMP. The San Miguel County Trails Plan was reviewed; no policies were listed and the map only focused on the eastern half of San Miguel County. Therefore, this plan was not applicable to this LRMP.

#### CHAPTER 3. MUNICIPALITIES

#### 3.1 City Of Cortez

#### City of Cortez Comprehensive Plan: 2008

All of the relevant policies in the City of Cortez Comprehensive Plan appear to be consistent with LRMP policies. Cortez emphasizes the importance of "critical lands" throughout its comprehensive plan. Maintaining water supply and quality is important, as well as soil health and productivity. Cortez recognizes the importance of recreational opportunities to its economy and focuses on collaboration with other agencies to support recreation in the area. Invasive species and noxious weed management, particularly tamarisk management, is discussed in Cortez's plan and the city's policies for its management are consistent with the LRMP.

#### Other Plans and Policies

The City of Cortez Land Use Code (2007) was also reviewed; no specific policies are related to public land management.

#### 3.2 Town Of Dolores

#### Town of Dolores Comprehensive Plan: 1997

The Town of Dolores Comprehensive Plan designates future land use and anticipates growth in the town. There are not many policies related to public land management. The town wishes to maintain its important natural and visual features, preserve wildlife habitat, and preserve and protect open space. Another objective states that the town wishes to connect town sidewalk to a trails system and public lands. No policies were found to conflict with the LRMP.

#### Town of Dolores Parks, Recreation, and Community Facilities Plan: 2005

The Town of Dolores Parks, Recreation, and Community Facilities Plan includes site-specific park planning for the town and a few more general policies related to public land management. The Dolores River, McPhee Reservoir, and public land proximity is highlighted as important to the town.

Specifically, the LRMP states:

3.2.6 The McPhee Reservoir area is one of the Four Corners' "recreation gems." A viable marina facility is re-established that offers, at a minimum, basic services for those enjoying water sports and fishing. A strong connection exists between the reservoir and the town of Dolores.

#### Other Plans and Policies

The Town of Dolores Land Use Code (2008) was also reviewed; no specific policies are related to public land management.

#### 3.3 Town Of Dove Creek

The Dolores County planning regulations regarding Dove Creek were reviewed; see review of Dolores County plans and policies above.

#### 3.4 City Of Durango

#### City of Durango Comprehensive Plan

The City of Durango Comprehensive Plan places emphasis on the protection of the Animas River, the value of open space, and the collaboration of many agencies to achieve the city's goals. Open space, under the jurisdiction of many different entities, is seen as a value for human use, recreation, wildlife habitat and migration, and scenic value. Durango recognizes the value of natural resources and its sustainable management to the city's economic vitality. No policies appear to conflict with the LRMP.

## City of Durango Parks, Open Space, Trails and Recreation Master Plan: 2010

Overall, the City of Durango Parks, Open Space, Trails and Recreation Plan is consistent with the LRMP. This plan is much more site specific within the city's comprehensive planning boundary than the LRMP, designating future trail opportunities and improvements. Policies related to public land managed by the BLM or USFS are in line with policies detailed in the LRMP.

#### Other Plans and Policies

The City of Durango Animas River Management Plan (2013) was reviewed; however, because this was a very site-specific plan, federal lands were not discussed and LRMP-relevant policies were not mentioned. Therefore, no inconsistencies were found. The City of Durango Land Use Code was also reviewed; no specific policies or regulations relating to public land management are included. Other policies reviewed were consistent with the LRMP.

#### 3.5 Town Of Pagosa Springs

#### Town of Pagosa Springs Comprehensive Plan: 2006

The Town of Pagosa Springs Comprehensive Plan lists broad policies for the protection of the natural environment, including maintaining water and air quality, wildlife habitat, and all other components of the town's valued natural setting. Economic vitality of the town is recognized to be tied to natural resource management, though the town hopes to diversify its economy, particularly seasonally. Outdoor recreation opportunities are also very important to the town. No policies appear to be in conflict with the LRMP.

#### Town of Pagosa Springs Land Use Code

The Land Use Code regulations regarding sensitive area protection are consistent with the LRMP. Other regulations reviewed were not relevant to the LRMP.

#### 3.6 Town Of Rico

#### Rico Regional Master Plan: 2004

Because Rico is surrounded by NFS land, many of its Regional Master Plan policies are relevant to the LRMP. Protection of soil and water resources and remediation from past contamination are major concerns discussed in the plan. Recreation is a vital part of Rico's economic health. Big-game hunting provides an economic boost for the town. Easy access to these recreational opportunities and trail access are important to the town.

A future USFS interpretive site, visitor's center, and parking lot are mentioned in the Rico Regional Master Plan. Informal and unmanaged camping is discussed as an issue for the town to coordinate a solution with the USFS. Future land use for NFS lands include passive recreation, limited motorized recreation, firewood extraction, removal of fuel woods to reduce forest fire risks, and limited small-scale logging of small-diameter forest products.

It is important to note that in the Rico Master Plan, a significant focus is placed on the "Rico Renaissance" land holdings, an extensive collection of land under the same ownership that is intermixed with NFS land. Policies are discussed for a future "extensive land exchange program" between Rico Renaissance and the USFS. The LRMP does not specifically mention this possibility, though one policy for the Rico special area is to improve and consolidate land ownership patterns. No policies appear to be inconsistent:

- 3.27.3 Land ownership patterns are improved and consolidated between the town, private landowners, and the SJNF in order to enhance community development objectives and to reduce resource impacts (including to the viewshed on the surrounding public lands).
- **3.27.4** Trails accessing SJNF-administered lands from within town boundaries emphasize non-motorized recreation modes in order to emphasize the community's quiet-use character.
- 3.27.6 Undeveloped areas and [Colorado Roadless Areas] on SJNF-administered lands near and/or around Rico provide quality elk and other large game habitat and wildlife corridors. These areas also provide quality hunting and wildlife viewing, as well as pristine backcountry non-motorized recreational experiences.

#### Town of Rico Three Mile Plan for Annexation: 2010

This plan discusses general characteristics of areas that may be suitable for future annexation under the provisions of the Municipal Annexation Act of 1965. Because this plan is mostly a study of land characteristics and assessment of annexation probability, its relevance to the LRMP is limited. The policies do not conflict with the LRMP.

#### Town of Rico Mineral Extraction Policy: 2009

The Town of Rico Mineral Extraction Policy establishes broad policy goals related to mining in the Rico area. The LRMP sets forth restricted management of leasable and saleable minerals in the Rico area. Locatable minerals are an allowed use in the Rico area, though they may be subject to restrictions to protect resources. None of the policies appear to conflict with the LRMP.

#### Town of Rico Land Use Code: 2011

The Town of Rico Land Use Code establishes particular development requirements for areas of state interest, including avalanche hazard areas, floodplain areas, geologic hazard areas, steep slopes, wetland areas, wildfire hazard areas, and wildlife habitat. The policies guiding these regulations are consistent with the LRMP.

#### 3.7 Town Of Silverton

See "Town of Silverton and San Juan County Master Plan: 2010" under the review of San Juan County plans and policies, above.

The Town of Silverton Zoning Code was reviewed and no policies were relevant to public land management.

#### **CHAPTER 4. TRIBES**

#### 4.1 Southern Ute Indian Tribe

The 2005 Southern Ute Indian Tribe Comprehensive Master Plan was reviewed; no policies appear to be in conflict with the LRMP. The Brunot Agreement, analyzed below, bears heavily on the management relationship between the SJNF/TRFO and the Southern Ute Indian Tribe.

#### 4.2 Ute Mountain Ute Tribe

The Ute Mountain Ute Tribe is in the process of developing an Integrated Resource Management Plan; however, the plan has not been finalized and a draft version is unavailable for review. No other plans or policies were made available for review. The Brunot Agreement, which outlines rights associated with lands now managed by the SJNF and TRFO, is discussed below.

#### The Brunot Agreement

The Brunot Agreement, ratified by Congress in 1874, withdrew over 5,000 square miles in the mountains of southwest Colorado from the 1868 Ute Reservation. The agreement, entered into between the United States (as represented by Felix Brunot) and the Ute Indians in Colorado, was passed into law (18 Stat., 36) by the House of Representatives and the Senate of the U.S. Congress on April 29, 1974 (after Congress decided in 1871 that the United States would no longer make treaties with Native American tribes, yet continued to interact with Native American tribes in much the same manner through executive orders and agreements enacted as statutes). Under the "reserved rights doctrine," hunting rights on reservation lands relinquished by the Utes were retained; that is, the tribes retained such rights as part of their status as prior and continuing sovereigns. Article II of the Brunot Agreement specified that "the United States shall permit the Ute Indians to hunt upon said lands so long as the game lasts and the Indians are at peace with the white people." The Ute Mountain Ute Tribe's hunting rights were acknowledged when the tribe sued the State of Colorado for their historical hunting rights in 1978. The rights were granted to the tribe under a consent decree that gave enrolled members of the Ute Mountain Ute Tribe the right to hunt deer and elk in the Brunot area for subsistence, religious, or ceremonial purposes. The consent decree specified that tribal members may hunt deer and elk without a state license year-round, providing that they obtain a tribal hunting permit. In 2013, the Ute Mountain Ute Tribe renegotiated this agreement with the State of Colorado to include the tribe's fishing rights and the right to hunt a certain number of black bears, moose, mountain goats, bighorn sheep, and mountain lions, in addition to the existing take of elk and mule deer within the Brunot area. Other game animals may be hunted without a license and without bag limits, but only during hunting seasons established by CPW. In 2008, the Southern Ute signed an agreement with the State of Colorado that reinstated their hunting and fishing rights within the Brunot area. The SJNF and TRFO will continue to ensure that the hunting and fishing rights of the 1873 Brunot Agreement are upheld on public lands under their management jurisdictions. In exercising their Brunot hunting rights, the Ute Mountain Ute and Southern Ute tribal members are required to adhere to federal policy and regulations designed to protect natural and cultural resources.

The SJNF and TRFO will continue to allow tribal members to collect botanical and other special forest products from public lands within the constraint of ecological sustainability. The SJNF and TRFO will also coordinate and collaborate with tribal governments to increase awareness and knowledge of culturally significant plants, and will consider potential impacts on culturally significant plants in project design and implementation. Prescribed burn plans, noxious weed control, and other management projects should address and consider traditional uses and traditional management of culturally significant plants.

Important cultural areas and traditional cultural properties will be protected for current and future tribal use. The SJNF and TRFO will continue to consult with tribes and pueblos, and knowledgeable individuals to identify important cultural areas and traditional cultural properties. If requested by the tribes, the SJNF and TRFO will keep information on such localities and uses confidential.

The SJNF and TRFO will maintain and strengthen the existing relationship of government-to-government consultation between the USFS and BLM and the 26 Native American tribes and pueblos that claim cultural affiliation with lands under each agency's jurisdiction. The SJNF and TRFO will develop consultation protocols and other formal agreements between the USFS and BLM and Native American tribes with direct communication between USFS and BLM line officers and tribal officials. The SJNF and TRFO will provide opportunities for tribal participation and partnerships in educational, interpretive, social, and economic programs and will continue to work with the tribes and pueblos to educate the public on appropriate and respectful etiquette when visiting culturally sensitive sites.

#### **CHAPTER 5. SOURCES**

#### 5.1 Counties

#### **Archuleta County**

Archuleta County Community Plan

http://www.archuletacounty.org/DocumentCenter/Home/View/203

Archuleta County Regional Parks, Recreation, Open Space, and Trails Master Plan http://www.archuletacounty.org/DocumentView.aspx?DID=213

Archuleta County Town-to-Lakes Trail Master Plan

http://www.archuletacounty.org/DocumentCenter/Home/View/216

Archuleta County Community Development Action Plan

http://www.archuletacounty.org/DocumentCenter/Home/View/350

Archuleta County Land Use Regulations

http://www.archuletacounty.org/index.aspx?nid=247

#### **Dolores County**

**Dolores County Master Plan** 

http://www.dolorescounty.org/documents/dolores county master plan.html

Dolores County Community Development Action Plan

http://www.scan.org/uploads/dolores 2012.pdf

**Dolores County Land Use Regulations** 

http://www.dolorescounty.org/documents/dolores county land use regulations.html

#### **Hinsdale County**

Lake City and Hinsdale County Community Plan

http://hinsdalecountycolorado.us/files/LakeCity-Hinsdale-Community\_Plan-120906-ADOPTED.pdf

Hinsdale County Community Wildfire Protection Plan

http://hinsdalecountycolorado.us/files/HCCWPP CWPP Final 8 26 10 Revised 06282011.pdf

Hinsdale County Zoning and Development Regulations

http://hinsdalecountycolorado.us/files/land\_use\_document\_august\_4\_2010\_revised\_08202010\_w eb\_Revised\_06222011.pdf

#### La Plata County

La Plata County Comprehensive Plan

http://www.co.laplata.co.us/departments elected officials/planning/comprehensive plan

La Plata County Regional Transit and Future Land Use Plan

http://co.laplata.co.us/sites/default/files/departments/planning/documents/La\_Plata\_Plan\_FINAL.pdf

La Plata County Trails Plan

http://co.laplata.co.us/sites/default/files/departments/planning/documents/2000trailsfinalplan.pdf

North County District Land Use Plan

 $\underline{\text{http://co.laplata.co.us/sites/default/files/departments/planning/codesplansmaps/documents/ncounty.pdf}$ 

Junction Creek District Land Use Plan

http://co.laplata.co.us/sites/default/files/departments/planning/codesplansmaps/documents/junc-crk.pdf

Vallecito District Land Use Plan

 $\underline{\text{http://co.laplata.co.us/sites/default/files/departments/planning/codesplansmaps/documents/vallecito.pdf}$ 

West Durango District Land Use Plan

http://co.laplata.co.us/sites/default/files/departments/planning/codesplansmaps/documents/westdgo.pdf

La Plata County Land Use Code

http://library.municode.com/HTML/13098/level1/CO.html

#### **Mineral County**

Mineral County Zoning Regulations

http://www.mineralcountycolorado.com/commissioners.html

Phone communication with Les Cahill, Mineral County Administrator. June 19, 2013.

#### Montezuma County

Montezuma County Comprehensive Land Use Plan

http://www.co.montezuma.co.us/documents/planning/Comp%20plan.pdf

Montezuma County Land Use Code

http://www.co.montezuma.co.us/documents/planning/LandUseCode Sept2010.pdf

Resolution requiring coordination with and from federal agencies

http://www.co.montezuma.co.us/documents/administration/Resolutions/BOCC\_Resolution2010-08.pdf

#### **Montrose County**

Montrose County Master Plan

http://www.co.montrose.co.us/DocumentView.aspx?DID=1031

Montrose County Zoning Regulations

http://www.co.montrose.co.us/DocumentCenter/Home/View/614

#### **Rio Grande County**

Rio Grande County Joint Master Plan

http://www.riograndecounty.org/images/stories/docs/landuse/Riograndecountymasterplan.pdf

Rio Grande Land Development Code

http://www.riograndecountv.org/images/stories/docs/landuse/revised\_rgdc\_flood\_2011.pdf

#### San Juan County

Town of Silverton and San Juan County Master Plan

http://www.sanjuancountycolorado.us/uploads/2/7/4/4/2744655/cmp.pdf

San Juan County Zoning and Land Use Regulations

http://www.sanjuancountycolorado.us/uploads/2/7/4/4/2744655/county\_code\_4.2013.pdf

#### San Miguel County

San Miguel County Comprehensive Development Plan

http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.COUNTY.PART1.2008.pdf

Wright's Mesa Master Plan

http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.WRIGHTSMESA.FE B08.pdf

Telluride Regional Area Master Plan

http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP\_TellurideRegionalAre a Part3 2009-8.pdf

San Miguel County Open Lands Plan

 $\underline{http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.OPENLANDS.PART4.\underline{2008.pdf}$ 

San Miguel County Trails Plan

http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.TRAILS.PART5.2008.pdf

San Miguel County Land Use Code

http://www.sanmiguelcounty.org/departments/planning/index.html?tab=1#tabsDepts

#### 5.2 Municipalities

#### City of Cortez

City of Cortez Comprehensive Plan

http://www.citvofcortez.com/sites/default/files/Comp%20Plan%208-5-08.pdf

City of Cortez Land Use Code

http://www.cityofcortez.com/sites/default/files/file/public works/Cortez LandUseCode.pdf

#### Town of Dolores

Town of Dolores Comprehensive Plan

http://gigshowcase.com/EndUserFiles/38912.pdf

Town of Dolores Parks, Recreation, and Community Facilities Plan 2005

http://gigshowcase.com/EndUserFiles/38913.pdf

Town of Dolores Land Use Code

http://gigshowcase.com/EndUserFiles/23634.pdf

#### City of Durango

City of Durango 2007 Comprehensive Plan

 $\frac{\text{ftp://ftp.ci.durango.co.us/Planning/Comprehensive} \% 20 Plan/Comp\% 20 Plan\% 20$ 

City of Durango Parks, Open Space, Trails, and Recreation Master Plan

http://www.durangogov.org/index.aspx?nid=554

City of Durango Animas River Management Plan

http://www.durangogov.org/index.aspx?NID=567

Durango Land Use and Development Code

http://library.municode.com/HTML/11771/level2/PTIICOOR CH27LAUSDECO.html

#### Town of Pagosa Springs

Town of Pagosa Springs Comprehensive Plan

http://www.pagosasprings.co.gov/index.asp?Type=B\_LIST&SEC=%7BF5A5939F-4139-403B-8833-560300FD8166%7D

Town of Pagosa Springs Land Use Code

http://www.pagosasprings.co.gov/vertical/Sites/%7B175F1D4C-10BE-47AA-AF3E-C1BCDE2446A6%7D/uploads/%7B91717D4F-EF80-425F-AFEC-903F48121248%7D.PDF

#### Town of Rico

Rico Regional Master Plan

http://www.ricocolorado.org/gov/documents/Rico\_Regional\_Master\_Plan\_FINAL\_8-18-2004.pdf

Town of Rico Three Mile Annexation Plan

http://www.ricocolorado.org/gov/documents/Town of Rico 3 Mile Annexation Plan Final.pdf

Rico Mineral Extraction Policy

http://www.ricocolorado.org/gov/documents/Rico Mineral Extraction Policy 2011-09.pdf

Town of Rico Land Use Code

http://www.ricocolorado.org/gov/RLUC Amended 6-15-11.pdf

#### Town of Silverton

Town of Silverton and San Juan County Master Plan

http://www.sanjuancountycolorado.us/uploads/2/7/4/4/2744655/cmp.pdf

Town of Silverton Zoning Code

http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=Content-

Disposition&blobheadername2=Content-

Type&blobheadervalue1=inline%3B+filename%3D%22Town+of+Silverton+Municipal+Code.pdf% 22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251 852383582&ssbinary=true

#### Tribes

#### **Brunot Agreement**

http://ocs.fortlewis.edu/forestplan/roundtable/brunotAgreement.pdf

Final San Juan National Forest and Proposed Tres Rios Field Office Land and Resource Management Plan

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